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TRANSPORTATION SERVICES

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HISTORICAL DIVISION
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Max BORK
Generalleutnant,
Cmdr of 47 Div in the
West and CiC of an army
corps, finally CiC of
Corps Group BORK.

Neustadt, 15 November 1947

Volume XVIII

CHAPTER I

THE CHIEF OF TRANSPORTATION AS REPRESENTATIVE OF OKH INTERESTS IN TRANSPORTATION MATTERS:

The Organization, Functions, and Facilities of this Agency !

1939 - 1942

FOREWORD

This volume, No XVIII of a series devoted to the organization and operations of OKH, the German Army High Command, and its general and special staff divisions, is the first of five, Nos XVIII through XXII, which deal with staff organization, functions and operations during World War II in the field of transportation.

Vol. XVIII, OKH Transportation Services, presents a general survey of the field from the point of view of the Chief of Transportation, as the representative of OKH interests in transportation matters. Chapter I outlines the mission, organization and operations of this agency, with attention to important problems encountered and their solutions, from 1939 to 1942. Chapter II continues the account from 1942 to the end of the war.

To facilitate reference to the German manuscripts of which these chapters are direct translations, it should be noted that in the original German manuscript arrangement Chapter I is identified as Study B-10a and Chapter II as B-10b. It is the German manuscript arrangement rather than the corresponding division into volumes which was followed in a synopsis of the OKH series published in December, 1949, by the Historical Division, Special Staff, US. Army, with the designation MS # T-111.

FOR THE BRANCH CHIEF,

Berle K. Hufford

BERLE K. HUFFORD
Capt FA

Max BORK, Generalleutnant
Born 1 January 1899, Lasdehnen,
Germany

Max Bork received his commission as Leutnant during World War I, on 1 August 1917, and served in the field as platoon leader, later as company leader until the war ended. Remaining in Germany's post-World War I army, he underwent training at the Munich Infantry School in 1922-23 and, after service in the 3rd Infantry Regiment, was assigned to the 6th Division as transportation officer in 1933. Following assignments as company leader in the 13th Infantry Regiment in 1935-36 and as operations officer in the 9th and 45th Infantry Divisions in 1936-38, Bork was transferred to OKH Headquarters at Berlin as transportation officer in 1939, at which time he had reached the rank of Oberstleutnant. He remained in this post until January 1942, being promoted Oberst in August 1941. On 1 February 1942 Bork was transferred to LII Infantry Corps on the Russian front as chief of staff and on 1 April 1943, again as chief of staff, to the Sixth Army, also in Russia, the latter transfer coinciding with his promotion to Generalmajor. Following a brief spell in the OKH Officer Reserve, General Bork was given command of the 47th Infantry Division on the western front on 1 September 1944. From 1 April to 26 June 1945 he served as acting CiC of an infantry corps and then as CiC of Corps Group Bork, a corps group being a temporary unit between corps and army level.

CONTENTS

Page

I. Mission 1

II. Organization 4

1. Chief of Wehrmacht Transportation 4
2. Field Transportation Branch 4
3. Planning Branch 5
4. Home Transportation Branch 6
5. Training and Personnel Branch 6
6. Field Agencies 7
7. Wehrmacht Transport Commands 8

III. Working Order 9

1. Within the General Staff 9
2. With the Government Authorities 12
3. Within the Transportation System 15

IV. The Most Important Phases and the Experience Gained in Them 21

1. The August-1939-Concentration 21
2. The 1939/40-Concentration of Forces in the West . . 25
3. Winter 1939/40 Regrouping for the Eastern Frontier and for the Balkan Campaign . . 31
4. The 1941-Campaign in Russia 35

Problems and their Solution. Planning and Carrying Out the Concentration 35

V. Summary 48

PART I

MISSION

The mission assigned to the Chief of Transportation, which agency had been formed out of the Fifth Branch of the Army General Staff as per mobilization plan, was as follows:

"The Chief of Transportation, attached to the staff of CiC, Army High Command under the Chief of Army General Staff, by order of the Wehrmacht High Command will direct the utilization of rail, road, and waterway facilities for purposes of the Wehrmacht, for war economy and other economic aims, and will issue the necessary orders in this connection. He will supervise the transportation system according to instructions from the Chief of Army General Staff, to whom he is responsible for their exact execution."

The accomplishment of this general order included:

1. The exercise of influence on the development of the transportation system.

2. The suggestion and promotion of new technical practices.

3. Representation of all demands for defense purposes in respect to the various traffic routes, construction and operation, technical developments thereof, and the build-up of personnel in the traffic installations capable of handling wartime duties.

4. Control of all raw materials necessary for the transportation installations.

5. Preparations for the movements of all three branches of the Armed Forces by road, rail and waterways.

6. Organization, training and employment of a military traffic organization for tasks connected with directing and supervising transportation during the war.

7. Development of a railway engineer force equipped with all necessary appliances and the command of the force in the war zones and in the ZI.

8. Adaptation of transportation tariffs to military and war economy purposes.

9. Direction of transportation connected with the war economy.

10. Use of foreign communication systems and other transportation facilities.

Although with the start of the war the military functions preponderated, development in all spheres was so sporadic that the Chief of Transportation had to make allowances by having his organization as many-sided, flexible and capable as possible.

Closest cooperation was necessary especially with the Reich Ministry of Transportation as the head of the whole communication system in the Reich, and with the Reich Railways as the chief traffic carriers. In spite of universal predictions to the contrary, the superiority of railroads for the transportation of large quantities of goods within a given time by a continental power was proved again in this war.

Already in peace all preliminary work had been done to ensure smooth cooperation with the Ministry of Transportation by organizing a special group, The National Defense Group *, within that Ministry, and by appointing Railway Commissioners to the Directorates of Railways as well as by means of joint training of all these personnel in transportation training maneuvers and practical transportation exercises conducted under the Fifth Division of Army General Staff.

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* Referred to as Defense Group throughout this manuscript.

PART II

ORGANIZATION
(cf. Annex 1)

After some initial tentative trials by the Chief of Transportation to arrive at an organization meeting all exigencies, an organization emerged in the first year, the main features of which survived until the end of the war, which fact proved its value.

1. The head of the agency was the Chief of Transportation who ranked as a commanding general. He was given OKW authority and sole responsibility for the general principles of the tasks enumerated in Part I and was the highest technical superior of the Railway Engineer forces. His personal staff consisted of a General Staff officer and two special missions staff officers.

2. The Field Transportation Branch was responsible for the control and arrangement of all troop, supply and war-economy transports for the front and the zone of the interior, for the utilization of foreign means of communication, the exploitation of technical experience, the representation of Army General Staff demands on the traffic installations, on the other sections of the Chief of Transportation and on subordinate offices, and finally for the conduct of all transportation matters in line with General Staff requirements. The Field Transportation Branch was a branch of the Army General Staff and was headed by a branch chief. Attached to it was a special Economy Transportation Group for handling the transportation requirements of the war economy, but primarily for direct-

ing them as Wehrmacht transports, or for handling general economic transports of the Reich Railways.

The organization, functions, and working methods, as well as experiences of the Field Transportation Branch will be given in detail in Vol. XIX THE FIELD TRANSPORTATION BRANCH and its FUNCTIONS. Operations Staff of the Chief of Transportation and Control Agency for Transportation of Men and Material by Rail, Road and inland Waterways.

3. The Planning Branch of the Chief of Transportation was the technical branch of the General Staff in the transportation system, it was responsible for the construction, operation and technical development of transportation routes and facilities and for transportation maps and regulations. It edited the Rail Routes Atlas and the compilation on Reich Railroad loading and unloading facilities. It also was the executive organ of the Chief of Transportation in the following matters:

a. The establishment and development of its own organization in the Reich and the occupied territories.

b. The organization and employment of the Field Railway Forces, and the Field Waterways units.

c. The organization of the railway engineer troops and control of their employment. In this case command authority passed to the Commander of Railway Engineers who was directly subordinate to the Chief of Transportation.

The Planning Branch cooperated closely with the technical offices of the Reich Transportation Ministry and the Inspector General for German Roads.

Important experience gained in the Russian theater of war is contained in Vol XX, the Planning Branch of the Chief of Transportation: its Mission and Function as Working Staff for Planning and Extending the Railway System in Russia 1941/42.

4. The Home Transportation Branch which developed from the former Commissioner for the War Transportation System, Home Branch, handled all Wehrmacht travel traffic, home leave traffic, frontier relay stations, and the interior German traffic, and represented the Economy Transportation Group in its demands on the Reich Transportation Ministry with regard to war economy transportation. In addition it maintained contact with the railway authorities at Berlin, under orders from the chief of Transportation. This activity was coupled at times with that of Wehrmacht transport control agency within the Reich (c.f. item 7). In 1942 all these functions were transferred to the Traffic Branch of the Chief of Transportation.

5. Training of the new personnel and care of the permanent personnel of the Transportation System was the responsibility of an independent agency, the TRAINING BRANCH of the Chief of Transportation, which in the course of the war was developed into a stationary transportation training school with training courses and a body of instructors for all officers, NCOs and EM employed in the transportation system, thereby creating the basis for the technical efficiency of this transportation system, which from small beginnings developed into an organization embracing all Europe. Personnel matters were handled by the PERSONNEL BRANCH, techni-

cally subordinate to the Army Personnel Office. On its own responsibility the Personnel Branch handled the steadily increasing number of personnel. Naturally it was linked closely with the Training Branch. The importance of the Personnel Branch is apparent in view of the fact that at times it had charge of roughly 4000 officers and 100.000 NCOs and enlisted men.

6. The regional control machinery corresponded to the central organization of the Chief of Transportation. It had to give technical advice on transportation questions to front and home command authorities and to ensure due execution of the local military transportation missions assigned and orders issued by the Chief of Transportation to the traffic carriers. Within its own fields it had to carry through all tasks on its own responsibility but in line with the orders given by the Chief of Transportation. Finally, whenever necessary it had to act as a field agency of the Chief of Transportation. These functions were performed by:

a. The various Transport Commander Offices formerly called Field Headquarters, as the military opposite numbers to the Reich Railways and Waterways Directorates in whose territory they were stationed.

b. The Authorized Transport Officers, who were General Staff officers, attached to higher level commands at the front.

c. The Transportation Liaison Officer attached to all territorial command agencies such as Corps Area Headquarters, and Military Commanders. A special task of the Transportation Liaison Officer was to carry out all Wehrmacht road transportation on the network of through roads constructed by the Economy Transportation Branch and supervised by the Inspector General of the Roads, Todt.

d. The Authorized Transport Officers in foreign parts were in a different position in that their transportation demands were not addressed directly to the traffic carriers, but rather to the General Staffs of the countries in which they were stationed. The fact that a measure of influence commensurate with their personal skill was gained in the foreign traffic administrations facilitated and accelerated the execution of transportation missions and rendered the execution more precise. Where successful co-operation was achieved further territorial working staffs were attached to the Authorized Transportation Officer, where necessary for his enlarged field of activity, e.g. Transport Commander Offices, Unloading Commissioners and Rail Depot Officers.

7. To simplify the chain of command in self-contained theaters of war and in territories with heavy transportation traffic of their own the territorial transport administrations were combined under Wehrmacht Transport Commands, which at the beginning of the war were termed Rail Transport Sections (Eisenbahntransportabteilungen, abbreviated Etra). These commands had command authority in the traffic areas subordinate to them in all matters connected with their own traffic, in loading and unloading all traffic movements ordered by the Field Transportation Branch, in traffic control and maintenance supervision, and over all military construction projects.

A detailed definition of all administrative transport centers enumerated under cyphers (6) and (7) will be given in Vol XXI, entitled:

The Field Agencies of the Chief of Transportation namely, Wehrmacht, Transport Commands, Transport Commanders Office, General of Transportation, Authorized Transport Officer and Authorized Transport Officer in Foreign territories, as Advisers to their Headquarters and Handling Transportation Missions.

PART III

WORKING ORDER

1. Within the Army General Staff

Instructions of a political nature, instructions affecting the war economy and instructions from the Ministry of War were channeled directly through the Chief of OKW to the Chief of Transportation in his capacity as Army Chief of Transportation. Basic directives of an operational character, however, were given by the Chief of Army General Staff to the Chief of Transportation personally. These operational orders included the demands of the other branches of the Armed Forces. Thus co-operation was specially close between the Chief of Army General Staff and the Chief of Transportation, which was essential as transportation connected with operations required lengthy preparatory work, such as advance planning and disposition, e.g., development of new concentration areas or the large scale evacuation of traffic and economic installations prior to a retirement of a front, in addition to careful advance thinking. On the other hand the Chief of Transportation in good time had to draw the attention of the Chief of Army General Staff to any changes in existing operational possibilities arising from improvement of or deterioration of traffic conditions. This cooperation was in the first place based on absolute mutual confidence.

Similar was the cooperation between the Operational Branch and the Field Transportation Branch and no task of the former was carried through without participation by the latter. All operational missions were assigned to the Field Transportation Branch by the Operational Branch together with the necessary data, and under directives from the latter all missions affecting the troops were assigned to the Field Transportation Branch by the Organizational Branch. The decisions of the Operational Branch with regard to troop concentrations, regrouping, attacks and retreats depended to a large extent on the volume, time and space transportation possibilities determined by the Field Transportation Branch.

Data for supply transportation were computed in cooperation with the Quartermaster General of the branches of the Wehrmacht. It was necessary for the Navy also to establish the post of a Quartermaster General, which it did at the instance of the Field Transportation Branch.

War economic transports to be handled as Wehrmacht transportation, such as Roumanian oil and grain, Servian copper, were defined in cooperation with the OKW War Economy Staff.

The transportation requirements of traffic carriers themselves was arranged in cooperation with these, while special transports, such as Reich Artillery and Reich Flak were arranged in cooperation with the inspectorates of those arms.

On the basis of these component requirement factors on the one hand, and the available transportation routes and facilities on the other, the Field Transportation Branch drafted a transportation outline. This outline indicated to each applicant how his requirements would be handled, giving volume, time and number of transports, as well as the means of transportation chosen, rail, road, or waterways. If this draft was approved and its execution ordered by the OKW through the Operational Branch the responsibility for the due performance of all the pertinent movements from loading or from commencement of the march, to arrival at the destination was transferred to the Field Transportation Branch.

The studies conducted by the Branch on traffic conditions in foreign countries supplemented the data available to the Army General Staff for operational decisions.

For these studies the Branch had a special Foreign Traffic Group. The comprehensive information on traffic and the reliable and rapidly available assessments of foreign traffic capacities obtainable from the files of this group ensured a timely participation in intended foreign traffic agreements.

Outside of these operational tasks the Branch was commissioned by the Chief of Transportation to represent and handle all General Staff demands within the transportation system. Further in collaboration with the General Staff Section of the Army Personnel Office it chose those General Staff officers who were to be assigned in the transportation system and supervised their training while stationed there.

In this way the Branch was the technical section of the Army General

Staff and beyond that was responsible within the Wehrmacht itself for all basic matters of transportation. Furthermore, it was the agency responsible for the carrying through of all movements of men and material for purposes of the Wehrmacht with the exception of marine shipping. However it maintained close contact with marine shipping through the pertinent agencies in the large ports as marine shipping naturally was one of its traffic carriers.

In comparison to this wide scope of General Staff work of Field Transportation Branch, as the operational organ of the Chief Transportation, the other branches remained in the background their functions being restricted to the purely technical side of their respective fields, e.g., the Planning Branch collaborating with the Organizational Branch in matters relating to transportation agencies, the Railway Engineer Force and Field Railway troops, and with the Chief of the Mapping and Surveying Office in matters relating to Transportation Route Atlases etc.

2. With the Government Authorities

The fundamental transportation demands on high Government authorities, as shown in Chap I were represented by the Chief of Transportation in his capacity as Wehrmacht Transportation Chief in personal contact with the chiefs of Government offices and departments.

Most important was collaboration with the Ministry of Transportation, especially in respect to the organization, construction and operation of interior and foreign routes for war purposes.

The fact that a common basis was always found and optimum efficiency almost always obtained from the traffic carriers in spite of the naturally conflicting interests — military demands for the conduct of the war on the one hand and on the other the interests of economy represented by the Minister, who was primarily an economist and held the post of Managing Director of the Reich Railways, the biggest traffic carriers operating as a non-State enterprise -- speaks volumes for the personalities involved.

Owing to the pre-war establishment of technical groups handling all military interests within the Ministry (the National Defense Group), as well as within the Directorates of railways and waterways, understanding for the needs of the Wehrmacht had progressed far and the technique of collaboration and cooperation was developed to a high degree.

In addition to the above functions the Wehrmacht Transportation Chief represented the following requirements:

a. In the Ministry of Labor: labor transfers that became necessary in the interest of both the traffic carriers and the Wehrmacht transport organizations as a result of Wehrmacht requirements, e.g., for the Field Railway Force and the Field Waterway units.

b. In the Administration of the Four Years Plan: the release of factory space and materials (steel, rare metals) for the purposes of the traffic carriers.

c. In relations with the Inspector General for German Roads: the organization, use, development and maintenance of roads within the Reich and in occupied countries, particularly the Reich Autobahns and the newly created European network of thoroughfares, the East-West through-routes 1 - 14 and the North-Southern routes A - W.

d. In relations with the Reich Commissioner for Coal: the additional supply of coal for the Reich Railway, the field railways and the waterways.

e. In the Ministry of Economy: particularly the movement of mineral oil from inland and foreign sources for purposes of the Wehrmacht and so forth.

In order to enable the Branch to handle all transportation problems smoothly and without loss of time, the Defense Group in the Ministry of Transportation had been attached to it. This Group handled all requirements of the Branch within the Ministry, issued the instructions to the railway putting the orders of the Branch into effect, supervised transportation, intervened with full command authority in traffic interruptions, was responsible for the movement of empties, regulated personnel and materiel at traffic centers and currently advised the Branch on possible improvements in the operational and organizational efficiency of railways. This obviated loss of time for negotiations between the Branch and authorities stationed at Berlin. The procedure fully served its purpose, and was particularly useful in view of the fact that the Branch, being attached to OKH, had to follow all transfers of OKH headquarters.

The Planning Branch on the other hand, owing to its numerous technical tasks, could not dispense with constant direct contact with the technical sections of the Ministry of Transportation, the Inspectorate General of Roads and the Reich Labor Ministry. As the Planning Branch had to follow Headquarters it left a sub-section at Berlin for liaison purposes. This liaison subsection, which was permanently stationed at Berlin, later developed into an independent branch, the Transportation Branch of Chief of Transportation, and assumed the functions of the Home Transport Branch. It then, on its own responsibility influenced the handling of railway materiel, tariffs, traffic regulations, the budget, and the protection of communication lines in line with

Wehrmacht requirements.

3. Within the Transportation System

After basic approval of their plans by the Chief of Transportation all branches handled their appropriate matters with full authority. All transportation agencies subordinate to the Chief of Transportation (cf. Annex 1) had to carry out the orders of the branches.

To explain this working order, two examples will be given:

a. Field Transportation Branch reparation for a troop concentration and the issue of commands by that branch.

b. Description of a working day within the headquarters of the Chief of Transportation.

Ad a: On the basis of the approved transportation outlines for operational movements (cf. Part III, item 1, par,b) the Field Transportation Branch commenced preparations for the troop concentration. The forces themselves, together with supply groups, were combined in specific movements, were given code designations, and marked on the railway or highway routes in various colors, e.g., transport road dotted green. Loading, start of the first transport, duration of transport and unloading were regulated by orders entered on printed forms. Instructions to the railway authorities for these movements were attached to the orders together with a list of keywords to set the individual transports moving. All movements to one and the same front were combined, were given the code designation of the operation involved, e.g., "Barbarossa", and passed on to the appropriate Railway Commissioners.

The Operational Branch was furnished all data on these movements, while extracts were forwarded to the individual Army Headquarters for the movements to their sectors. Each movement was timed as flexibly as possible, occasionally up to four starting possibilities within twenty-four hours being provided, so that a movement could be released by the High Command as late as possible in order to facilitate camouflage and to enhance the surprise element. This complicated the preparatory work, but not the execution itself.

When the order to initiate a concentration was received the Field Transportation Branch through its own communication network set the ordered movements in motion according to plan and by aid of the list of key-words. The order for loading was given to the responsible Railway Commissioner, and the orders to integrate the individual trains with the movement at specified stations were forwarded to the appropriate Transport Commander Offices. The transports were then passed on from transportation area to transportation area and in the destination areas were handled by the competent Wehrmacht Transport Control Agencies or by the Authorized Transportation Officers, who also were responsible for unloading if the unloading area for tactical reasons was assigned to a command agency at the front. If the latter was not the case, the Transport Officer of the front command forwarded his wishes as to unloading to the appropriate Wehrmacht Transport Control Agency. The loading or unloading of the individual transports of a movement at various railway stations or localities was handled by unloading officers or rail depot officers subordinated for this purpose to the local Transport Commander Offices or to the local Transport Officers.

The progress of the concentration was facilitated by:

a. Introduction of a maximum capacity train schedule, ensuring for each transport route a maximum number of Wehrmacht trains, and maintaining only an emergency service for civilians.

b. Due adjustment of material and personnel to render possible the extra load on the main line in preference over the branch lines.

c. The provision of suitable rolling stock in standard trains, i.e. trains adapted to all service arms without the necessity of re-shunting.

d. The systematic handling of returning rolling stock for use in later transport trains according to the concentration plan.

If traffic interruptions necessitated a change in the schedule, the Field Transportation Branch alone was authorized to issue the necessary orders to alter directions, to stop or re-start, to unload prematurely or to extend the movement, as only this Branch had a general conception of the concentration plan and its tendencies. This necessitated a flexible, speedy and accurate issuance of orders, as well as a precisely functioning communication network.

The 1939-concentration of forces, for instance, was carried through with 572 trains daily on two transport routes in the West and 252 trains daily on five transport routes in the East, and was wound up punctually to the minute without hitch, which proves the precision of the preparatory work and of orders as well as the high standard of efficiency of the railways in carrying everything through according to plan. And these feats were even surpassed during the war.

Ad b: The daily routine at headquarters of the Chief of Transportation started with the sorting and assessment of information on the transport situation received from the field agencies, the Wehrmacht Transport Control Agencies, the Transport Commander Offices, the Authorized Transportation Officers and so forth, during the night and processed by the officers on night duty and having reference to the situation at the front, the status of movements, location of individual transports, situation of the traffic carriers as to operations, constructions and personnel, activity of the railway troops (repairs, change of gauge, interruptions, destructions) and the situation at the field railways, unusual occurences and emergency remedies, and finally requests of the field agencies in their own interests or in the interests of their respective command posts.

The department chiefs and the Commander of the Railway Engineers then submitted a joint report on the results of their assessment to the Chief of Transportation together with suggestions, and asked for his decisions. Decisions that the Chief of Transportation could make on his own responsibility were put into effect immediately. If fundamental matters were involved he obtained decisions from the Chief, OKW or from the Chief of Army General Staff, in the latter case during the daily morning situation report. The Chief of the Field Transportation Branch also attended these oral reports and, with the aid of his transportation outlines and route maps was expected to be able to give all desired information on the spot about the status of movements, to assess how alterations in the plans of operations might affect the transportation plan and to draw attention to new possibilities. The report on the resumption of traffic on previously destroyed routes, or on increased capacities, was of equal importance.

The decisions arrived at were given effect immediately in orders drafted and issued by the respective branches, but not before agreement had been reached with the appropriate divisions of the General Staff and with the field agencies of the Chief of Transportation on all details as to the drafting.

All orders of the branches were transmitted by teletype. The Transportation Teletype Network, the HEKTORNETZ, was specially arranged for this purpose and its personnel were trained in time of peace. Its efficiency may be demonstrated by the fact that the Field Transportation Branch alone registered up to 1200 in- and outgoing messages daily. These orders also were issued on printed forms and the procedure proved satisfactory both for security purposes, as nobody knew more than he had to know, and in that it relieved pressure on the normal communication system.

Orders to OKM and OKL were channeled through the Liaison Officers permanently attached to the Field Transportation Branch, as were the requests of those branches of the Wehrmacht.

The operational instructions for the ordered transports of the day were handled independently by the Defense Group in the Ministry of Transportation. The scope of activity of this group has been explained above.

A large part of the day's work consisted of scheduled telephone conversation that certain sections had to conduct regularly with the Chief of the field agencies. These conversations supplied the data for the control of transports en route, for construction and operation requirements and for all specific or basic requests and orders arising from the situation at the front. Furthermore, this was the only possible way to maintain constant personal contact with the field agencies, which otherwise would have been left to themselves owing to their being so far distant. Actually this telephone connection constituted the backbone of the transportation work. If during a crisis it became impossible to maintain it at all, or if it would only be continued on an inadequate scale, the command system suffered. At such times the lack of a transportation service radio network was felt severely.

All situations and problems arising during the day were clarified through cooperation of the various branches and settled by the issue of new instructions. Questions necessitating a technical decision were reported by the branch chiefs to the Chief of Transportation, while those demanding an operational decision were prepared in cooperation with the appropriate divisions of the General Staff and submitted in special reports to the Chief of Army General Staff for decision.

The result of the day's work was summarized in the daily evening situation report to the Chief of Army General Staff and finally submitted by the Chief of Transportation in a consolidated report to the Chief of OKH.

It deserves mention that the organization of the Chief of Transportation during the first years of war was always able to keep pace with all intended measures in spite of the wide scope of its duties, and although the organization as well as that of the traffic carriers was constantly growing and constantly was faced by ever new personnel, technical, and operational problems and an ever changing operational situation. The form of cooperation within and outside of the General Staff stood all tests and must be considered as fitted for the purpose.

PART IV

THE MOST IMPORTANT PHASES AND THE EXPERIENCE GAINED IN THEM

1. The August-1939-Concentration

The mission of the Chief of Transportation in this concentration was as follows:

a. To move all materiel and personnel within the Reich required in the mobilization of the Wehrmacht.

b. In Eastern Germany the movement of numerous sapper units to improve the defensive strength on the eastern frontier and the preparation of a plan to develop this sapper movement into a systematic concentration of troops if the political situation should make this necessary.

c. In the West the movement of a border force to the frontier, which was to be reinforced in the event of mobilization and if the political situation changed. The integration of a steadily increasing volume of material for further construction work on the Westwall and for the air defense zone west into the current flow of traffic.

All possibilities uncovered during the annual revision of plans for security concentrations in the East and the West were laid down in the peacetime preparatory work, in which work the leading authorities were allowed a free hand.

Provision had been made for the following measures:

a. The movement as advance forces of the first and second waves of sapper forces in the East.

b. The simultaneous movement of the third wave of sapper forces followed by supplementary personnel to bring them up to war strength, and at the same time the first wave of the frontier security forces in the West.

c. The later movement of the second wave of the reinforced frontier security forces in the West, followed by transports bringing this wave up to war strength.

d. Movements (b) and (c) simultaneously, for which purpose the maximum service train schedule had to be introduced.

e. All movements on call independently of each other within the peace traffic schedule.

f. Four separate possible starting deadlines within twenty-four hours.

g. Final definite order of departure, with first train to start eight hours after pre-warning.

Here again control was effected by the use of key-words.

In the West, owing to the densely developed net of communication lines, there was no difficulty in the actual carrying through of these movements even under the threat of airraids. Nine railway routes, each with a daily capacity of 72 trains in each direction and adequate re-routing possibilities were available besides a well-organized network of through highways with a high degree of carrying capacity, which could be used together with the Berlin-Rhine Autobahn.

Conditions in the East were less favorable. Only four rail routes were available with a daily capacity of 48 to 60 trains each, a fifth with 36 trains and an unimportant roadnet without any Autobahn.

Neither the requisitioning nor the timely assembly of rolling stock, nor yet the personnel transfers and increases made necessary by mobilization placed any considerable strain on the Reich railways. About 4000 trains were run over an average distance of 200 km. The total number of trucks required by the railway was 55000.

The concentration functioned like clockwork. There were no accidents and no air attacks. The pre-arranged schedule was maintained to the minute.

The young Railway Engineer Force stood its first test in the East. Within twelve days after the outbreak of war the railway bridge over the Vistula at Dirschau, the whole length of which had been blasted, was repaired by the use of pre-fabricated bridge equipment, so that after 20 years of separation the first direct communication line to East Prussia had been re-established. By the close of the campaign all normal European-gauge railways in Poland had been so far restored that it was possible to truck all non-motorized forces in the country. No destruction had taken place that could not be repaired with the means of the Railway Engineers. The organization of the transportation system almost kept pace with the invasion.

The repaired lines were soon transferred from the Authorized Transportation Officers to the newly installed Transport Commander Offices at Krakau, Warsaw and Danzig, and operation of railways passed to the Railway Administration of the Government General in Central Poland. Adequate Polish personnel and rolling stock were available so that the Ministry of Transportation could confine itself to supervision by German personnel in key positions and augmentation of the present rolling stock. The Polish transportation personnel fulfilled their functions with but a few lapses during crises. Had they been treated more liberally in respect to wages and food these lapses also would have been avoided. The integration of road traffic and traffic on the only important waterway, the Vistula, went without hitch.

Experience gained:

a. Traffic and unloading capacities were to be raised to modern standards. Seven rail routes were called for with a total daily capacity of 504 trains to effect East-West displacements of troops without loss of time.

b. Two through highways were to be added to the roadnet in Eastern Germany, while the roadnet of the Gouvernement General was to be incorporated into the network of through highways and its density increased near the frontier.

Requirements (a) and (b) were combined in the OTTO program which was initiated immediately.

c. The Wehrmacht needed a military operating group to handle the transfer of the advance traffic, the traffic handled by the Railway Engineers immediately behind the fronts to systematic control and management by traffic carriers made available from the Reich, which transfer needed a certain space of time. The establishment of field railway units, so-called grey railway personnel as compared with the railway personnel of the Reich Railway, who wore blue uniforms, and field waterway units was decided.

d. Decisive for the successful operation of a railroad system in an occupied territory is the number of locomotives and rolling stock available and the condition in which existing installations are found. To meet this uncertainty our traffic administration was required to keep available a sufficient stock of material and transportable traffic installations such as point-switch boxes, and new building material. Compliance with this demand was destined to play a significant role in the campaign against Russia, as we shall learn later.

e. The employment of foreign traffic personnel must be ruled by professional capability and not by political considerations. The readiness of such personnel for active cooperation must be promoted by economic amenities, but independence should be granted only to an extent that cannot endanger the front.

f. In areas with a small loading and unloading capacity it proved wise to have separate loading and unloading locations for motorized and for non-motorized forces. The motorized units must be handled in high-capacity locations, which they can reach or leave under their own power. In this way the high capacity of interior German routes can be utilized fully.

g. The development of standard train types, I, A, and K trains, on the basis of space requirements for infantry, artillery and motized units, respectively, proved a wise action and substantially accelerated the marshaling and circulation of trains.

h. The requirements of rolling stock by the German formations were too large, e.g., one infantry division 65 to 75 trains, and with the deterioration of loading discipline the requirements grew. A fight against these high train requirements began, and it ended in the separation of each unit into a combat echelon and a reinforcement echelon.

i. The maximum capacity schedule proved its value, but could be adhered to only for a limited period to avoid strangling the economic traffic.

2. The 1939/40-concentration of forces in the West

The assigned mission called primarily for two separate concentrations:

a. The pre-planned regrouping of the Eastern forces after the Polish campaign as reinforcements for the frontier forces in the West, and for training purposes in assembly areas along the western frontier of the Reich.

b. The speedy movement of these forces from their assembly into their concentration areas, with due consideration for the armored formations that were to attack directly out of their approach movement.

The regrouping as per item (a) could be done without difficulty as occasion demanded at the peacetime maximum rate of 18 - 24 trains daily on each route, particularly since there was no hurry owing to the postponement of the attack from Autumn 1939 to Spring 1940.

Movement (b) on the other hand necessitated a full concentration plan based on the maximum capacity schedule, the timely marshaling of large quantities of rolling stock, which severely transferred the economic transports, and the timely displacement of personnel to areas most affected by the maximum capacity schedule. In consequence, from an early stage the concentration and its main point of effort could no longer be camouflaged.

Therefore it was important to wind up this part of the concentration within the shortest time possible. This was achieved by using numerous rail routes at the maximum (72 trains daily) speed, by developing unloading points as small as possible but with high capacities and by minute control of the carrying capacities of the march routes. Gaps in the marching columns were filled in by unloading units at the points where they occurred. Also in this case four possible starting deadlines per day were provided for the armored formations to safeguard the surprise effect.

The minimum time of notification for issue of orders to set the formations in motion was reduced to six hours, and finally a movement into two alternate unloading areas was prepared, one being behind the right wing of the Army and one behind the center of the front.

To avoid loss of time in elaborating new plans in case of destruction of any of the routes by air attacks, detour plans were prepared for each transport route in the region on both sides of the Rhine. These plans were deposited with the Transport Commanders and Railway Directorates. These measures only had to be put into effect twice and on those two occasions they proved so efficacious that the movements concerned suffered no delay worth mention.

Upon invasion of the western enemy countries with their numerous artificial waterways and dense railway net much greater destruction was to be expected than in Poland, which necessitated a considerable reinforcement of the Railway Engineers and field waterway units both in personnel and materiel. It was necessary to include them in the marching formations as far ahead as possible to enable them to move into the occupied territory rapidly and undertake repair work on a wide scale. The forward movement of the forces earmarked for commitment in the center sector as the point of main effort in the attack, was a highly important feature. Therefore the Chief of Transportation before the start of the campaign had prepared for construction of a line detouring the Trier traffic bottleneck and leading through Echternach in Luxemburg to link up with the important railway line to Dinant. This measure was to prove of decisive importance later on as a supply line for the Guderian Panzer Army. The detour route was completed six days after the campaign started.

Traffic administration in the highly developed Franco-Belgian communication area absorbed large numbers of personnel of the German traffic carriers and of the Chief of Transportation. For the technical management a larg number of transportation agencies were combined under the Etra West, later called Wehrmacht Transport Control Agency in Paris, while to control operations and to supervise the French traffic organizations Wehrmacht Transportation Directorates had to be created jointly by the Ministry of Transportation and the Chief of Transportation. From the outset the Dutch were granted their own administration under loose supervision by Germans, as they were dependent economically upon secure traffic connection with Germany, a calculation which saved men and material and proved to be correct.

After the start of the attack the most important task of the Chief of Transportation was, as usual, repair work. As it was a foregone conclusion that the repair work would not keep pace with the attack on account of the great number of artificial constructions, it was decided that priority must be given to the repair of one line behind the right wing of the army and one behind its center, and that only when these lines were functioning the rest of the railway network should be repaired, with the well developed waterway system which was important for the French economy, taking third priority. The Railway Engineer Forces, the German building contractors, who were employed here for the first time on a large scale, and the traffic organizations, were all committed in line with this established order of sequence.

The difficulties naturally arising in the new detrucking areas, on which at times several armies were dependent, had to be smoothed over by a rigid distribution scheme, and the authorized Transportation Officers here proved their worth for the first time as responsible command and control organs. However,any system of this type will always remain an emergency measure.

Experience gained:

a. The centralized control of the entire traffic system in the West by the Chief of Transportation once again stood the test. In any campaign the operational control and the transportation control must be separated. Even a temporary and regional subordination of the entire traffic system to an interested party, for instance, to the Quartermaster General, would prevent a centralized and concentrated full exploitation of the transportation system to cope with all appropriate missions, of which those connected with operations form only one part.

b. The rapid development of operations in the West confirmed the necessity, already experienced in the Polish campaign, of maintaining Wehrmacht control for a longer period of time. This knowledge accelerated the development of the field railway commands. A further logical step under these circumstances would have been to militarize the civil traffic carriers, even if only temporarily, or to subordinate them to military command, but this was not done as Hitler decided against it.

c. In large zones of operations the materiel and personnel available to the Railway Engineer Forces and in the Field Waterway Battalions will only suffice for emergency repair work, without any consideration for major repairs to roads at all. Therefore, as a second step, efficient building contractors must be brought in from the ZI and employed for permanent structures, especially for construction of heavy bridges. Sooner or later these firms must be supplemented and gradually replaced by indigenous firms in order not to deprive the ZI war industry of their services for too long. Here again the temporary militarization of such firms must be given serious consideration from the standpoint that in a zone of operations only soldiers should be employed. I myself consider it wrong to use non-military formations of any kind, including the Organization Todt, during an operation, for reasons of technical command, efficiency, and for psychological reasons. They should only be employed when operations cease and the occupied territory is transferred to civil administration.

d. Rapidly developing operations in wide areas can be supplied by means of railways alone only in a country with a dense railway net, such as is to be found in the western countries. For wide areas with a less well developed railway system additional transportation facilities must be provided in the shape of motorized mass transportation. Waterways must be left out of all calculations on account of their vulnerabiltity and the slow movement of traffic. Thus the campaign in the West was also the birth hour of large scale motor transportation.

e. Demolition of the Franco/Belgian traffic system was very heavy but not well planned. Detour lines, for instance, had only been paralyzed or even left quite intact. A clever, technically skillful survey of all communication routes by the transportation organizations soon discovered which traverses were most favorable for repair. Rolling stock had not been destroyed, so that it could even be utilized for reinforcing the interior Geman traffic.

Conclusions drawn:

Measures to paralyze traffic are useless if the enemy is familiar with modern repair methods and they should not be applied in future. Demolitions should be effected within closed demolition zones, in which all ways and means of communication should be destroyed. They should be planned systematically and require lengthy preparations and can never be made subject to the wishes of the front troops.

f. The surprise effect of a troop concentration by railway can be secured only if the movement of personnel and materiel reinforcements on the transport routes, as well as their unloading and assembly areas can be concealed. That is possible only if all measures are spread over a long period of time and have the appearance of systematic displacements of an economic nature, e.g. season traffic pressure. Any chance of surprise ceases at latest with the introduction of the maximum efficiency schedule and the time that is needed to prepare such introduction also indicates the deadline for the start of the campaign.

g. The personnel and materiel reserves of the German traffic carriers were insufficient for the creation of further control and supervisory organizations, unless the Wehrmacht released enough personnel and unless sizeable stocks of materiel were captured in enemy territories. This realization was of importance for further large scale campaigns.

3. Winter 1940/41. Regrouping for the Eastern Frontier and for the Balkan Campaign

After the conclusion of the western campaign the demobilization that was initiated, and that applied also to the transportation system, was discontinued and the Chief of Transportation received contrary orders on account of the changed political situation. These orders were to reinforce the weak security forces left at the new eastern frontier, using units of the western armies for this purpose.

The overall German traffic situation, strained at this time by seasonal mass transports of potatoes, turnips, manure, winter-coal and so forth, profited from the fact that the regrouping could be spread over a longer period and could take place at a slower pace, so that the peace schedule served the purpose. Furthermore, half of the rolling stock that had been used during the West campaign could be released for economic traffic.

The regrouping also was facilitated by the progress meanwhile made in organizing the eastern region under the OTTO program, which had produced two through lines with a total capacity of 96 trains daily. However, this capacity still being insufficient to cope with the traffic brought forward over the transportation system in Germany proper, and as the unloaded formations could only move out of the unloading areas slowly owingto the lack of suitable roads, the OTTO program of October 1940 had to be accelerated. The construction organization of the Reich Railway was applied in a concentrated effort. In addition half of the available Railway Engineers were transferred to the East, although repair work in the Franco/Belgian regions had by no means reached an adequate stage. These measures were necessary because capacities in the East and the West had to be equalized to make rapid movement of strategic reserves on the continent possible if the war continued.

For road building purposes a special construction organization was formed under an experienced expert from the Inspectorate General of Roads, and this organisation within six months solved the problem of building and improving roughly 3,000 kilometers of roads in the border areas.

That the Ministry of Transportation succeeded in accomplishing the Railway construction program in the East within the same time was due alone to the initiative of the Chief of Transportation. Without his constant drastic pressure, without his successful negotiations with the Administration of the Four Years Plan for liberal allocation of steel and other rare materials, and without the realease of the required labor from the Wehrmacht, the construction would not have succeeded. What did happen may be called a unique achievement in view of the magnitude of the task and the short time taken to fulfill it.

In spring 1941 seven throughlines to the new eastern frontier of the Reich or the eastern demarcation line were available, with a daily capacity of 420 trains.In addition there was an eighth route through Roumania which,however, owing to its use for oil transportation, would be available to Germany and Italy only if placed under German traffic control.

For all these reasons no difficulties arose in carrying through the regrouping for the East.

At this juncture, however, while the movement to the East was taking place, the order was given at the end of March 1941 to concentrate against Yugoslavia and Greece.

Taken by surprise, the Chief of Transportation had no time to elaborate a concentration plan. The forces intended for this campaign had to be dispatched as part of the normal traffic schedule and handled individually. Numerous other transports had to be diverted from the west-east to the north-south movement. This re-routing proceeded smoothly without delay.

The next mission was to include the transportation systems of the south-eastern region, Hungary, Roumania and Bulgaria, in general transportation planning. Organizationally this was achieved by personal contact between the Chief of Transportation and the General Staffs and Ministries of Transport of these countries, and by the attachment of German transportation agencies to those bodies. Hitherto, the only agencies of this type in existence had been the Wehrmacht Transport-Commander for the South East in Vienna and the Authorized Transportation Officer on the German military mission in Roumania. These agencies now were supplemented by the Transport Commander Offices at Pressburg, Budapest, Bukarest and Sofia. The Ministry of Transportation was able to restrict itself to a small scale support in railway material, chiefly locomotives, for these countries, and had to arrange for German traffic supervision only in Roumania, a measure that was to prove advantageous for the right wing of the army during the Russian campaign.

How well and how fast the transportation centers in these countries worked becomes apparent from the surprisingly quick development of the unloading areas Nagykanisza in Hungary, Temeszvar in Roumania and of the area to the East and Southeast of Sofia. All these areas were ready on arrival of the first transports. Their detrucking capacity, modest in spite of the enlargement, was sufficient, and this applied also to their traffic capacity, because the first attacking wave consisted almost exclusively of motorized formations, of which only the track-laying vehicles needed transportation by railway to the terminals, whereas all other elements were unloaded on Reich territory or around Budapest. Thus, the bottlenecks represented by the bridge at Cernavoda and by the Danube railway ferry at Rustschuck only became apparent at a later juncture, when the bridge was hit from the air and temporarily put out of commission. For better passage the supply trains had to be reduced in size to the measure customary in the Balkans, about half a normal German train. Dividing the trains before their arrival in areas with small traffic capacity considerably slowed down their dispatch and the Chief of Transportation therefore changed the customary use of standard trains by inserting trains of Balkan size in the home trucking areas.

Due to the short duration of the campaign no operational and only the following war economic demands on the transportation system arose:

a. Guaranteed delivery of the maximum output of Roumanian oil (350,000 tons per month) and flour.

b. The creation of an efficient railway connection with Bulgaria and European Turkey on the one hand and Greece on the other.

To reach the goal under (a) the Chief of Transportation ordered an increase of the traffic capacity of the Roumanian railways and the construction of a tanker fleet on the Danube, under the responsibility of the transportation system. The Chief of Transportation also took over the operation of these systems and assigned responsibility for such operation to the Wehrmacht Transportation Command Office for the Southeast in Vienna.

To solve (b) repair work was concentrated on the only efficient line via Belgrad - Nisch. That this line never reached full importance was due to the military and political conditions in the Yugoslav and later in the Greek regions. The most important section, that beyond Sofia to European Turkey was soon open for traffic after the largest obstacle had been overcome by a quick decision to repair the bridge at the Bulgarian-Turkish frontier without waiting for the result of diplomatic negotiations. What would have been the outcome of such negotiations can be judged by the fact that a large-scale road-repair program for the Balkans petered out altogether. No special experience was gained by the Chief of Transportation during the campaign in the Balkans.

4. The 1941-Campaign in Russia

Problems and their solution before the start of the campaign. On receiving the order to prepare the BARBAROSSA troop concentration in spring 1941 the Chief of Transportation was faced by the following difficulties:

a. The railway network in Western Russia was so poorly developed that generally speaking only three reliable railway lines were available. These were:

Lemberg - Fastow - Snamenka - Stalino - Rostow, Brest - Litowsk - Minsk - Smolensk - Moscow, Duenaburg - Pleskau - Leningrad. They were assigned in logical order to the three leading army groups in the East. Initially, a top daily capacity of not more than 24 trains each was to be expected.

b. The basic condition for ensuring supplies to the army groups by these rail lines was that the centers of gravity of the operations should follow the lines and that the operations should progress too rapidly for the Russians to find time for large-scale demolitions of the line, and its technical installations and rolling stock, particularly the powerful wide-gauge locomotives.

c. Even with fulfilment of the conditions under (b) higher capacity demands were bound to result for operational reasons before long, as the existing maximum capacity was insufficient if reserves were to be moved in addition to supplies. Furthermore, there was the difficulty of transhipment from normal to wide gauge cars at the Reich frontier. Therefore, a change of gauge and increase of capacity was aimed at from the outset, for the accomplishment of which much time was needed.

d. This increase of capacity could be reached at best within a year. So that while troop transports occupied the rail line supplies had to be moved chiefly by motor transports, which from lack of solid roads could only be effected during the dry season. To build up a modern road system on central European lines was out of question as the construction units available were inadequate for the wide expanses.

e. It was not certain that the German locomotives could withstand the Russian winter.

f. In consideration of the mentality of the Russian command, it was to be assumed that adequate indigenous professional personnel would not be available. Provision therefore had to be made for a rapid transfer of both German rolling stock and German traffic personnel on a large scale. The personnel were to be equipped, trained, and armed to meet Russian conditions as the men would have to work on their own initiative spread over a wide area

These preparations also needed a long time.

g. Every conceivable measure to ease the traffic load of the railway was to be taken, even if it helped ever so little. The early opening of navigable waterways, and of marine shipping for Army Group North therefore was of particular importance.

h. The protection of the communication lines was to be the responsibility of the transportation system.

i. Owing to the enormous distances the traffic capacity to a large extent depended upon good signal communication services.

k. To secure a proper system of command a large number of field agencies of the Chief of Transportation had to be organized and the personnel trained, and these agencies had to be combined under a central command for the entire Eastern theater.

Marginal note:

These problems increased considerably in number and urgency after 1942 in consequence of the long duration of the campaign, increasing enemy resistance, and the reverses suffered by the German forces.

How they were solved is described in Chap. II of Vol. XVIII and in Vol. XX.

In addition to planning the concentration, the problems just indicated had to be solved. The difficulties would arise only after the frontier was passed, but the success of the military operations depended upon their removal before operations began. The time available for due preparations was inadequate and this disadvantage could have been offset only by a liberal fulfilment of the demands of the Chief of Transportation, something that frequently did not happen however.

So far as (a) and (b) are concerned, the Chief of Army General Staff included the traffic capacities and the consequences resulting therefrom for the conduct of battle in his operational orders. Unfortunately, the significance of these directives was not realized.

In respect to (c) it was decided that the change of gauge should precede the capacity increase. It is an open question whether the operational consequences of this decision were fully realized. It is my opinion that more thorough preparation, both in respect to personnel and material, for a simultaneous change of gauge and increase of capacity would have been possible. All that would have been needed would have been timely appropriate measures by the Supreme Command and it would have taken more time. That it could have been done even in Germany, the poor man's country was proved by the 1942 construction program for the East (cf. Vol XX).

The Chief of Transportation now had to shift the emphasis of training for the Railway Engineers so as to develop a high degree of proficiency in changing the gauge of the Russian railways. All Railway Engineers were needed for this work. Therefore the Railway Engineer Force would have to turn over each section to the railway agencies for operation as soon as it was completed. At that time the blue-uniformed railway personnel of the Ministry of Transportation were not yet full ready and as the railway traffic near the frontier had to serve the purposes of the front, the railway operating personnel had to be of a purely military character. The decision to create a field railway force, arrived at already in 1940, now took shape and three railway commands were formed. Each was provided with an operations staff and railroad operating units, the total strength being roughly 10,000. Thus, there was one field railway command for each army group zone. In the beginning these commands lacked all experience in the leadership of this subject of military operating formation.

For change of gauge and increase of capacity abundant reserves of building material were kept moving forward or stockpiled in the ZI. German coal was provided, as the Russian locomotives were mostly fired with wood, which was unsuitable for German locomotives.

d. The demand was made that the transportation load be placed equally between the railway and the motorized transportation system created and controlled by the Army Chief Supply and Administration Officer (Generalquartiermeister), but could not be pressed through, because the latter refused to surrender full control of his transportation capacity even temporarily. At this juncture rivalry started between the Chief of Transportation and the Army Chief Supply and Administration Officer.

e. A standard-type locomotive had been developed for the Reich railways. It was suitable for winter conditions and in addition required less steel and rare metals than the normal models. Instructions were given by the Chief of Transportation to commence the serial construction of this locomotive but Hitler ordered that it was to take second place to the panzer production program.

f. For the occupation of the Russian traffic areas the Ministry of Transportation provided Traffic Directorates together with the necessary administrative, operating, repairshop and construction personnel as well as prime movers and reserve stocks of material. The personnel were equipped and trained in special camps, where reserves of such personnel were also kept in readiness. Only with much difficulty the Chief of Transportation succeeded in obtaining from OKW the release of these personnel, the peak number of which was 300.000.

g. Suitable field waterway commands were prepared to handle repair work and traffic operation, the capacity of the Roumanian railways was increased from 24 half to 36 full trains daily, and a large program started to develop the Danube shipping, which primarily was to relieve the railway of the heavy burden of oil transports. Large tankers of 3 - 5000 tons were to be built for this purpose.

h. In the wide spaces of Russia it was not possible for the field forces to protect the traffic system, so that the so-called blue railwaymen had to protect themselves and their installations. In spite of the general scarcity, the necessary arms were procured.

To facilitate the protection of transport trains the number of anti-aircraft cars was increased. For the supply trains a transport escort service was created and consolidated in transport escort regiments.

i. A railway signal regiment was formed for each of the three field railway commands. The demand for further organic signal units of the transportation system, especially radio communication for transmitting orders of the Chief of Transportation, was not granted owing to lack of equipment.

k. Central command in the Russian theater was transferred to the Wehrmacht Transport Commander Office at Warsaw as soon as the concentration started and the Transport Control Headquarters at Krakow, Lemberg, Warsaw, Koenigsberg, Danzig, Posen and Breslau were subordinated to that office. Staffs for two further such offices and for ten other transport control offices, a number of off-loading commissioners and rail depot traffic officers were held in readiness. As no more experts could be obtained from the traffic carriers for these increased duties, the training activities of the Chief of

Transportation became of decisive importance. The Transportation school at Venlo was started from scratch. In tenacious work this school gave basic training to the personnel of all transport agencies. This basic training was followed by a spell of practical work in already operating transport agencies, so that every soldier enlisted in the traffic system was sufficiently prepared.

In summarizing it can be said that the transportation problems presented by the Russian theater were recognized and that measures to solve them had been initiated by the Chief of Transportation, but that though they were progressing smoothly, these measures were by no means complete where the attack began.

Preparation and Execution of the Troop Concentration.

The regrouping of parts of the Western army (See Part IV, Cypher 3) was concluded in spring as planned in spite of the fact that some of its units had to be diverted to the Balkan campaign. All that remained to be done for the concentration therefore was the handling of the bulk of the mobile forces and the operational reserves from the Reich and Western Europe and the movement of the Balkan forces destined for the German right wing army, the Eleventh Army. The difficult part of this task was the transportation from the Balkans which could not be exactly scheduled owing to the varying capacities of the foreign railway administrations, the bottlenecks at Cernavoda and at the Danube ferry, and the increasing number of raids on the Yugoslav railway. That the movement nevertheless was accomplished successfully therefore deserves special mention. The measures introduced by the Chief of Transportation to supervise construction and traffic operations in Hungary, Roumania and other Balkan countries bore fruit.

Conditions were more favorable in the Gouvernement General and East Prussia after the conclusion of the OTTO program. To bring up the mobile forces and reserves a total transportation capacity of 438 trains daily now was available, representing an increase of almost 100 percent over 1939 capacities. This capacity made it possible to fulfill the demand of the Army High Command that commencement of the movements should be delayed until the last moment and then should take place at the utmost speed. No difficulties were encountered in directing the movements to the army groups in accordance with their strength and their missions.

The allocations made were as follows:

Army	Group	South	132	trains	daily
"	"	Center	168	"	"
"	"	North	138	"	"

to points on the new eastern frontier of the Reich and to the Dnjestr River in Roumania.

Preparation and execution of the BARBAROSSA troop concentration were carried through in the usual manner. The strain imposed on the German economy by the requisitioning of rolling stock for Southeastern Europe was rendered bearable because the gaps thus created were filled by material supplied by the French and Belgian administrations, and because the repair status was not greatly impaired. The increased capacity of the Reich Railways as compared with 1939 capacities is reflected in the number of cars made available and the number of Wehrmacht trains run. The figures are as follows: 33.800 trains with about 200.000 cars moved within 5 months for the BARBAROSSA concentration, including the Balkan campaign.

Command and technical management functioned without friction, and no considerable interruptions occurred, due largely to the fact that the enemy airforce in the East was not yet active. The program therefore was fulfilled on time.

Difficulties arose only after the start of the attack. Contrary to orders the army group did not follow the railway line, with the result that the Russians gained time to save their material and destroy the line, especially the installations. Frequently the railway engineers had to take the railway line in combat before they could commence their repair work. The loss of time was deplorable and caused serious frintion between local commands and their appropriate transport agencies, because the railway now could not follow the advancing troops fast enough. Furthermore, on account of the heavy destructions, the traffic capacity fell far below expectations. For a long time only twelve trains per day could be made available to each army group. This disadvantage was not so serious while operations were moving forward sharply and while the Russian roads remained usable for motorized traffic, but the moment motorized transportation ceased at the start of the wet season, the rail capacity proved inadequate for supplies. As an emergency measure the Chief of Transportation now urged repair of all available branch lines. The number of such lines was small and the gain insignificant. All prerequisites for an increase of rail capacities were still lacking, because, owing to the Chief of Transportation's having been called upon too late for cooperation in the Russian Campaign, the measures he had prepared beforehand with a clear understanding of the difficulties that were to be expected could not become effective at this juncture.

The early arrival of the Russian winter worsened the situation considerably, as the German locomotives became frost-bound, up to 70 percent being put out of commission at times. Also, repair work on destroyed installations, particularly on the vital water towers, was delayed by the severe frost. At the same time the front suffered reverses at Moscow and Rschew, which logically led to Army High Command ordering that strategic reserves be moved to the threatened points by rail, while out of supplies already en route only trains with immediately required commodities were to proceed forward. These two orders both represented demands that the Chief of Transportation, when planning the concentration, had declared would be impossible to fulfill, but his statement had been accepted without comment at the time. For the first time a heavy backlog now accumulated because of the lack of locomotives, a backlog that could not be handled with traffic capacities in their present stage of development. The return of empties from the front and their dispatch to the ZI, where they were most urgently needed, also suffered. On one day in December alone, more than 10.000 wounded men were left unattended on the Wjasma station, as they could not be transported owing to lack of hospital trains. This situation only changed when the Chief of Transportation marshaled temporary hospital trains from returning empties, a mission for which he was not responsible.

A very serious crisis arose in respect to the personnel situation of the Reich Railways. Only small numbers of the indigenous personnel, who were accustomed to the severe winter conditions, were available, and even these could be used only in subordinate positions, as laborers. Owing to lack of foresight on the part of the Supreme Command the German personnel, in equal measure with the front forces, were not equipped for a Russian winter, their billets and food were utterly inadequate, while far more work was required of them than had been the case under the well-regulated ZI conditions, to which all railway men were accustomed.

The ability to improvize, which is absolutely essential under Russian conditions, was lacking entirely, so that all emergency measures taken in respect to personnel and materiel remained inadequate makeshifts. The situation was further aggravated when motorized transportation came to a complete standstill during snow, when extraordinarily high numbers of German and indigenous personnel were needed to clear the tracks. Thus, the transportation system lived from hand to mouth through this severe winter. A proper traffic schedule had become impossible through the serious losses in rolling stock,and severe control and restriction of traffic from the ZI set in at a time when the offensive had by no means been brought to an end. Traffic within the ZI was reduced to the lowest minimum and the effect on the war economy was noticeable. Coal and raw material supplies to the industry lagged, millions of hundredweights of potatoes in the Eastern territories froze before they reached the consumers. Furthermore, waterway traffic, which usually could be employed in the ZI to balance rail transportation restrictions, also had to be suspended on account of the severe cold.

It can hardly be denied that the 1940/41 winter operations were decisively influenced by the complete failure of the Reich Government to make timely provisions. The German transportation system suffered such severe losses that its force remained reduced by 33 percent in spite of all new personnel brought in from the West. But the catastrophe also brought advantages. The German transportation system gained in toughness and experience and developed a system of improvising which enabled it to avert the danger of total collapse of the traffic system in spite of all difficulties.

Experiences gained:

a. Offensive operations in wide areas must follow the existing lines of communication if lack of personnel and materiel make it essential to avoid total destruction of railroads and railroad installations. The traffic centers and the traffic routes must be aims of equal importance in all operations. If this is not the case the operation cannot be fed with safety from the rear, so that it might fail in its chief aim, the annihilation of the enemy forces. The situation is different for a modern state with ample personnel and materiel reserves available close to the front and which can be moved swiftly to wherever necessary by truck or by air to repair lines of communication. In such cases panzer operations will aim at surprising and outflanking the enemy forces concentrated along communication lines and at communication centers, in order to attack them in the rear in a battle with reversed fronts, which, in the light of the principle of annihilation ruling today, is the only type of operation offering good prospects of success.

b. All means of the transportation system must be united under one control in order to ensure their concentrated employment. This applies chiefly to territories with climatic conditions that influence traffic capacities. The total capacity will depend on that traffic carrier which has the highest continuous capacity, the modern railway. Uniform command can be ensured only by a military transportation system.

c. Restoration of materiel and personnel in demolished areas must be accelerated to avoid delay in operations. For this purpose a strong, well equipped construction force, organized along military lines and under a central command is indispensable. The civilian traffic organization must follow the military closely, so that its personnel must be trained in the above-mentioned construction force. Its mobilization plan must provide for the mass assignment of personnel to occupied territories.

d. The demands on the transportation system in the Russian theater could only be met by a considerable increase in the capacity of the traffic network. For this purpose the Chief of Transportation designed a large building program, the OSTBAU 1942, obtained Hitler's approval for the necessary allocations of men and material and for execution of the program by the Ministry of Transportation and the Inspectorate General of Roads.

e. Preparations for campaigning in Eastern Europe must include transportation means and installations that will be impervious to extreme winter conditions.

Suitable rolling stock must be provided and delicate installations must be protected against cold. The personnel must be protected by means of suitable clothing, food and quartering. Their arms and equipment must be protected by frost-resistant oil and frost-proof material.

f. Although the system of command centralized in the Chief of Transportation had stood the test, the local command authority of the field agencies that were familiar with local conditions had to be established. Realization of this fact led to the creation of new organs, the Generals of the Transportation System, for territories that had to be regarded as homogeneous units in respect to military operations and traffic. These generals were given command authority, and all construction work and traffic management, together with all appropriate personnel, were subordinated to them in territories threatened by crises or in which interlocking problems had to be solved. Such an organization should have been created immediately at the outbreak of war. Lack of experience and the desire of the Chief of Transportation to retain full central control in order to avoid dissipation of the small available forces prevented the development of this practical organization. The intention of the OKH to use the army group headquarters as operational staffs exclusively would not have been affected adversely.

g. In the critical situations that arose in this theater of war the realization once again proved true in the traffic organization that the technician must take second place behind the high grade leader possessing the best human qualities and able to meet all emergencies.

Summary:

In the foregoing pages the mission of, and the work done by, the Chief of Transportation during the first phase of the war have been treated, showing the problems and their solution. Some of the problems were of a basic nature, some became visible during the offensive movements of the war. Chiefly they were concerned with preparation of the transportation system for the offensive, with planning and execution of the concentrations and with feeding the military operations.

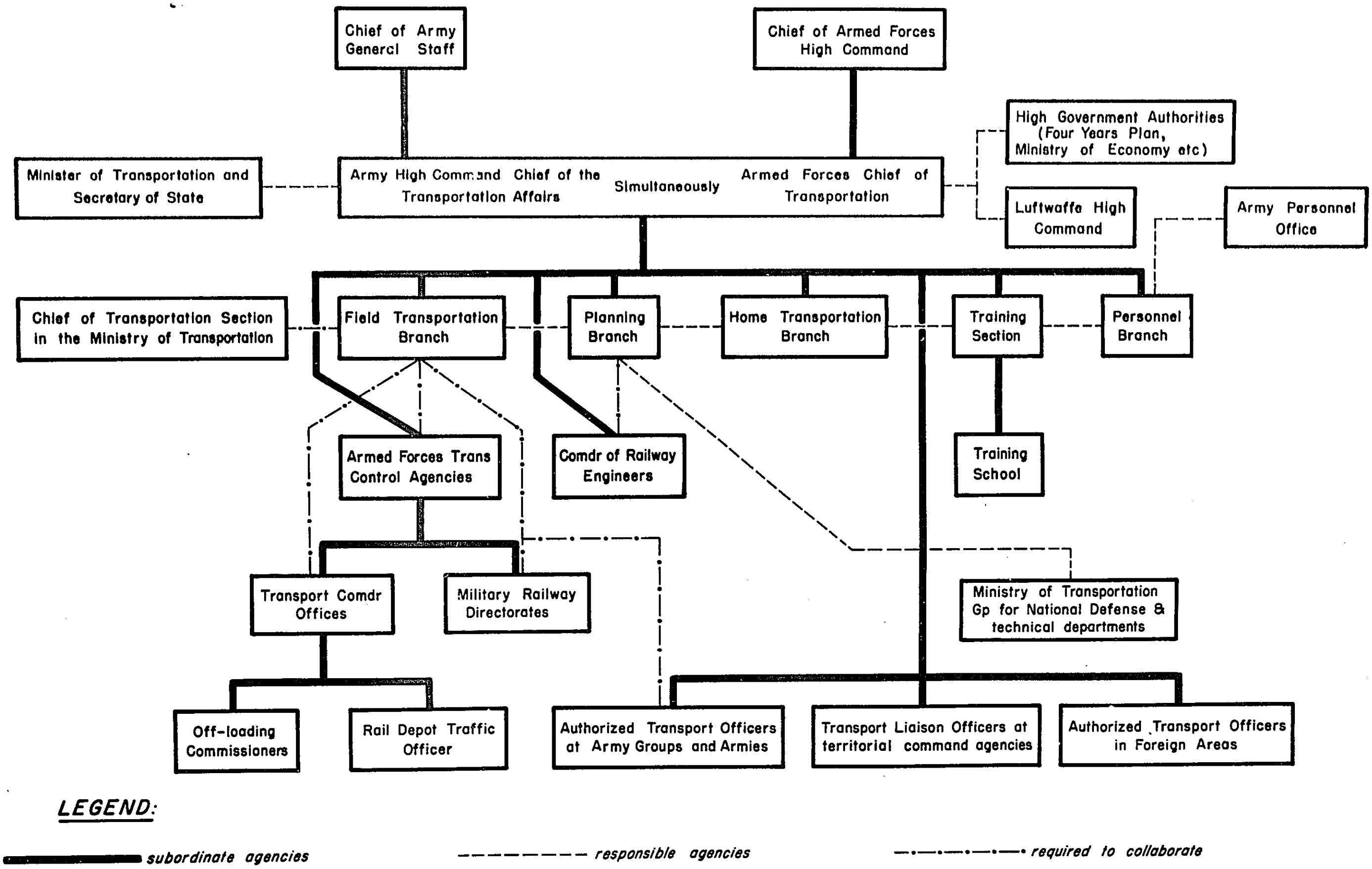
The impetus which should be behind every true offensive made it possible for the transportation system to accomplish feats that deserve special emphasis, as they did not result from peace time preparations but rather were the result of an organization formed during the war and of experiences gained mostly by improvisation. It also raised the civil sector of the German transportation system, particularly the Reich Railways above the level of purely economic reasoning and action to a comprehension of military issues which made possible the measure of success of which both the transportation and the communication system have every right to be proud.

Two points have thus been established, the one being that if the traffic system is guided by the proper spirit it will not require military top-level control. The other point is that the control over so complicated an apparatus should be in the hands of the best available expert, and that fluctuations caused by changing the man in control would prove detrimental. It was due only to a proper application of these principles that it proved possible during the first phase of the war to meet all demands of the Army High Command on the transportation system promptly and efficiently.

Signed Max BORK

Appendix 1

CHIEF OF TRANSPORTATION
ORGANIZATION AND CHAIN OF COMMAND

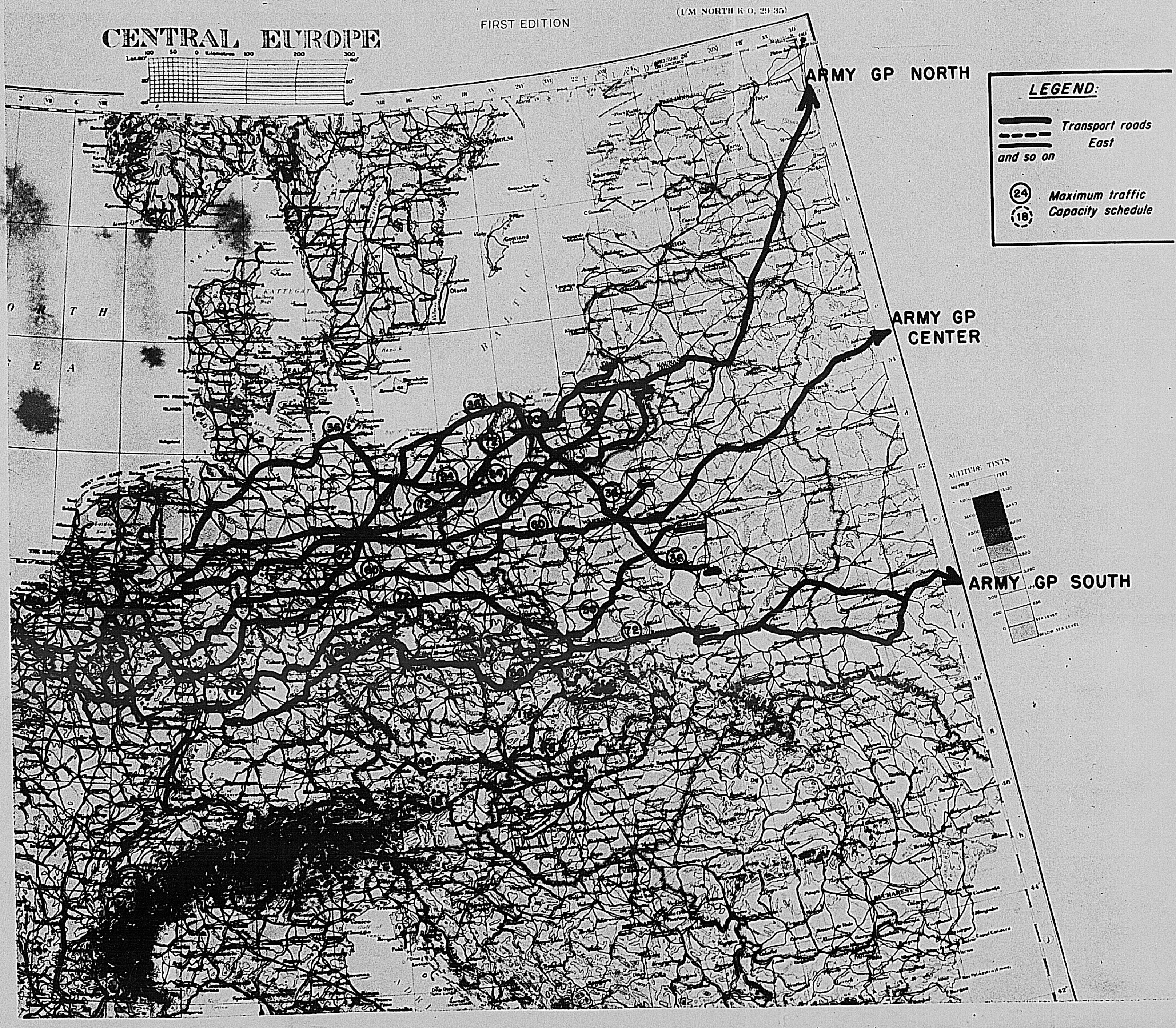

Chief of Army General Staff
Chief of Armed Forces High Command
High Government Authorities (Four Years Plan, Ministry of Economy etc)
Minister of Transportation and Secretary of State
Army High Command Chief of the Transportation Affairs
Simultaneously
Armed Forces Chief of Transportation
Luftwaffe High Command
Army Personnel Office
Chief of Transportation Section in the Ministry of Transportation
Field Transportation Branch
Planning Branch
Home Transportation Branch
Training Section
Personnel Branch
Armed Forces Trans Control Agencies
Comdr of Railway Engineers
Training School
Transport Comdr Offices
Military Railway Directorates
Ministry of Transportation Gp for National Defense & technical departments
Off-loading Commissioners
Rail Depot Traffic Officer
Authorized Transport Officers at Army Groups and Armies
Transport Liaison Officers at territorial command agencies
Authorized Transport Officers in Foreign Areas
LEGEND:
subordinate agencies
responsible agencies
required to collaborate

PATTERN FOR A PROJECTED TRANSPORT SCHEDULE

Serial Number	Unit	Number of Trains	Loading Rail Depots with daily loading capacities	Daily loading capacity	Transportation Route	Off-Loading Rail Depots with Daily off-loading capacities	Daily offloading capacity	Speed	Distance			Remarks
									km	hour		
1	2	3	4	5	6	7	8	9	10		22 23 24 25 26 27 28 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	11
1.)	"EIFEL" 1) 444. Inf Div 2) 454. Inf Div 3)	1.) OELS-BRIEG 2.) FREYHAN-KUSCHWITZ 3.) CORPS AREA IV		┈	1.) RZESZOW 2) TARNOW-BOCHNIA 3.) TARNOW-BOCHNIA		㊱	390	20	NEISS	
2.)	"TAUNUS" 97. (light) Inf Div		TOELZ		▬	PRESOV		⑱	990	50	MUENCHEN	
3.)	"URAL" 99. (light) Inf Div		HAMMELBURG		┈	DEBIZA-SANDOMIERZ		㊽	1080	54	WUERZBURG	
4.)	"SCHWARZWALD" Flak Units		REICH		┈	RZESZOW-KRAKAU		㊽	660	33		
5.)	"NECKAR" Army Forces (Rifle plat's Reichs Labor Service Bns., Decon Bn Orgn Todt)		REICH		┈	KAMENZ-HEYDEBRECK		㊽	1290	50	TRILPORT	
6.)	"PEGNITZ" 100. (light) Inf Div and Bn 500		DOELLERSHEIM		▬	PRESOV		⑨	420	24	MARCHEGG	
7.)	"ELBE" Luftwaffe Units		REICH		┈	RZESZOW-KRAKAU		㊽	600	24	DRESDEN	
8.)	"PREGEL" 125. Inf Div (OKH. Res)		GRAZ		▬	PRESOV		⑨	600	24	BRUCK (MUR)	
9.)	"ODER" Army forces 6 (Rail Flak Bn 306 + 307) 9. Pz.		REICH		┈	(9. Pz. ROZWADOV) (Tracklaying) To be decided by 6		㉔	330	14	ODERBERG	
10.)	"WESER" 14. Pz. Inf Regt Gr Deutschl Rail Arty etc.		REICH		▬	(14. Pz. RADOM-DEBLIN) Inf Regt Gr.Deutschl. KIELCE Rail Arty ZAMOSCH		㊽	840	34	JUETEPBOG	
11.)	Army forces (Cons Bn)		REICH		▬	ZAMOSCH-ROZWADOW		㊽	1080	43	KREIENSEN	

ANNEX 3

MAP OF TRANSPORTATION SYSTEM EAST



MS # P-041r

Project # 7

O K H

Vol XVIII

TRANSPORTATION SERVICES

Translator: G. C. VANDERSTADT
Editor: Capt HUFFORD

HISTORICAL DIVISION
EUROPEAN COMMAND

Karl Theodor KOERNER
Generalmajor,
Born: 10 July 1899 in Breslau,
Silesia, now Polish
territory.

During World War I KOERNER received training as a naval cadet and then served as officer candidate on the battle ship "Grosser Kurfuerst." At the end of the war he was discharged and in January 1919 joined the Army, entering the 21st Infantry Regiment in Silesia as an officer candidate. Following advanced training in officer courses in Berlin in 1932 - 35 he was appointed Transportation Officer in Stettin, Pommerania, until transferred in October 1936 to the Fifth Division of the Army General Staff as a technical officer in transportation matters. This post he retained until assigned as company commander in the 63rd Infantry Regiment on 1 November 1938. After the outbreak of war KOERNER was appointed Authorized Transportation Officer to Army Group South in Poland and later accompanied the Army Group when it was transferred to the West. From then he remained in the transportation services until the war ended, with a brief break as Operations Officer, 297th Infantry Division, in Poland and Russia from October 1940 to August 1941. The posts he held after this on the staff of the OKH Chief of Transportation included that of Chief of Planning Branch from September 1941 to January 1942, Chief of Field Transportation Branch, from January 1942-1944 and finally he was appointed Plenipotentiary General in transportation matters on 1 May 1944, although his promotion to general rank, as Generalmajor, only took place in August of that year. General KOERNER was taken prisoner at Saalfelden, Tyrol on 9 May 1945. -

MS # P-041r
Karl Theodor KOERNER
Generalmajor
Chief of Field Transportation
Branch, and Plenipotentiary
General in Transportation
Matters.

Neustadt, January 1948

Volume XVIII

CHAPTER II

THE CHIEF OF TRANSPORTATION AS REPRESENTATIVE OF OKH INTERESTS IN TRANSPORTATION MATTERS

The Organization, Functions, and Facilities of this Agency

1942 - 1945

CONTENTS

Page

I. Organization During the Second Half of the War 1

A. Organizations Subordinate to the Chief of Transportation 1

1. Transportation Agencies 1

2. Railway Engineer Troops 2

3. Field Railway Units 2

4. Field Waterway Units. 3

5. Personnel Strengths. 3

B. Organization of the Reich Railways. 4

1. Within the Reich 4

2. Outside the Reich 4

C. Position in Regard to Certain Questions. 5

1. Question of Subordination of Chief of Transportation to the Generalquartiermeister* 5

2. Question of Transfer of the Military Transportation System to the Reich Railways 6

II. Missions and Effectiveness. 8

A. In the East 8

1. Russia 8

a. Available Railway Network, Demolitions, Locomotives, Rolling Stock 8

b. Necessity for Converting to Standard Gauge Track 9

(1) Lack of Sufficient Locomotives and Rolling Stock. . . 9

(2) Lack of Repair Shops 9

(3) Necessity for Transloading Points. 9

(4) Time Factor in Converting Track 9

---

* Generalquartiermeister: General staff officer in charge of supply and administration at headquarters of field forces.

CONTENTS

Page

I. Organization During the Second Half of the War 1

A. Organizations Subordinate to the Chief of Transportation 1

1. Transportation Agencies 1
2. Railway Engineer Troops 2
3. Field Railway Units 2
4. Field Waterway Units. 3
5. Personnel Strengths.. 3

B. Organization of the Reich Railways. 4

1. Within the Reich 4
2. Outside the Reich 4

C. Position in Regard to Certain Questions.. 5

1. Question of Subordination of Chief of Transportation to the Generalquartiermeister* 5
2. Question of Transfer of the Military Transportation System to the Reich Railways 6

II. Missions and Effectiveness. 8

A. In the East 8

1. Russia 8

a. Available Railway Network, Demolitions, Locomotives, Rolling Stock 8

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(4) Time Factor in Converting Track 9

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CONTENTS (CONT) Page

(5) Conversion of Rolling Stock 9
(6) Disposition of Wide-Gauge Locomotives 10
c. New Construction. 10
(1) General Requirements Influencing Planning 10
(2) Special Requirements 10
(3) Improvement of Installations 11
(4) Improvement of Communications 11
(5) Improvements Completed 11
d. Influences Prejudicial to Performance 12
(1) Winter Conditions 12
(2) Partisan Activities 12
(3) Air Attacks 14
(4) Performance of Lines Transferred to Rumania 14
(5) Cooperation of Indigenous Personnel 14
2. Poland -- Performance and Improvements. 15
B. South-East -- Performance and Improvements. 16
1. Hungary. 16
2. Slovakia 17
3. Rumania 17
4. Croatia - Serbia 17
5. Greece 18
C. Italy 19
D. In the West 19
E. Reich and Protectorate 23
III. Effect of the Air War and Countermeasures 24

CONTENTS (CONT)

Page

A. Effect of Russian Air Attacks 24

B. Effect of Allied Air Attacks 25

C. Eifel Offensive 26

D. West - 1944-45 26

IV. General Summary of Performance During Second Half of War. . 28

A. Troop Movements 28

B. Transportation of Individual Units. 30

C. Leave Traffic 30

D. Supplies 32

E. Initial Organization Transports for New Units 33

V. Special Questions 34

A. Measures Taken to Curtail Transportation Demands. . . . 34

B. Allocation of Capacity to Consumers 37

C. Measures Affecting Traffic 38

VI. Internal Waterways and Road Traffic. 39

VII. Conclusion 40

APPENDICES: 1 and 2: Organizational Charts
3: Map
4: Sketch

I. Organization During the Second Half of the War

A. Organizations Subordinate to the Chief of Transportation

1. Transportation Agencies

As a result of experience gained in the War, which had now lasted for several years, organization of the staff of the Chief of Transportation and subordinate agencies abroad had undergone repeated changes. The final organization is outlined in Appendices I and II, which deal with the staff of the Chief of Transportation and field agencies of that office respectively.

The structures were uniform for the central staff and, at top levels, for the field agencies. In the case of the latter a clean cut division into the following three different types of agency had been made:

a. General of Transportation "North" (or "West","Italy", etc.).
b. Armed Forces Transportation Command.
c. Chief German Transportation Officer.

Generals of Transportation were attached to all army groups. Armed Forces Transportation Commands were assigned to the rear, in the Reich, in the "Generalgouvernement," in the Protectorate and in some countries friendly to Germany. Chief German Transportation Officers were to be found in all allied and friendly countries.

From the technical viewpoint the Luftwaffe and Navy headquarters were serviced by the higher transportation agencies in whose scope they were included. The same arrangement was followed for servicing the Commander of the Replacement Army and the other Wehrmacht headquarters in the Z.I.

2. Railway Engineer Troops.

The railway engineer troops subordinate to the Chief of Transportation were coordinated at the top level under the Chief of Railway Engineer Troops, who, during the first half of the war, had been designated Commander of the Railway Engineer Troops. He worked in close cooperation with the Planning Branch of the Chief of Transportation. During the course of the war this branch evolved more and more into a general staff branch under the Chief of Railway Engineer Troops.

In the theaters of war and in the Z.I., the railway engineer troops were placed under control of brigade staffs which were, tactically, subordinate to the Generals of Transportation and, functionally, to the Chief of Railway Engineer Troops. Regimental and battalion headquarters worked under the brigade staffs.

3. Field Railway Units:

Up to the end of the war a common headquarters -- something like a Chief of Railway Units -- had not been created. At top levels these units were represented in the branches of the Chief of Transportation, as far as personnel matters were concerned, by the Personnel Branch, and in questions affecting their commitment, by the Planning Branch.

The field railway units were organized in field railway detachments. In the main their personnel consisted of professional railway workers, approximately 10 % of their strength being military specialists.

4. Field Waterways Units:

Created for traffic on the inland waterways of the occupied territories, its personnel derived from boatmen on the inland waterways of the Reich.

At top levels they were like railway units, controlled by the Planning and Personnel Branches of the Chief of Transportation. Their commitment was regulated by the Generals of Transportation.

5. Personnel Strengths:

At the time of our greatest territorial expansion, the Chief of Transportation controlled a total of 4,000 officers and 100,000 men. These were distributed as follows:

a. Transportation Agencies, approximately 10,000 men.

b. Field Railway Units, approximately 40,000 men.

c. Railway Engineers and Railway Construction Troops, approximately 50,000 men.

B. Organization of the Reich Railways

1. Within the Reich

Within the Reich territory, the Reich railway division managements continued to operate during the war.

In the "Generalgouvernement," however, the railways were independent and directly subordinate to the Governor General. The Reich Minister of Transportation had only supervisory powers over them. A great deal of friction occurred during the course of the war through this independence of the Polish railways, all of it due to this error in organization. Every attempt made by the Chief of Transportation to incorporate these railways into the Reich network and to place them wholly under the authority of the Reich Ministry of Transportation failed.

Although in the Protectorate the railways were likewise subordinate to the government of the Protectorate, in contrast to what took place in the Generalgouvernement no difficulties arose in the transportation system.

2. Outside the Reich

Outside Reich territory all railways were at the outset subordinated to the Reich Ministry of Transportation, so that, as far as cooperation with the field transportation agencies was concerned, there was the same situation as that prevailing in the Reich. There were exceptions only as pertained to the scope of authority of field railway headquarters, for the agencies of the Reich railways exercised supervisory rights and the right of giving orders only in matters relating to service and affecting Servia and Greece, where a plenipotentiary of the Reich railways was appointed only toward the end of the war.

C. Position in Regard to Certain Questions

1. Question of Subordination of Chief of Transportation to the Generalquartiermeister of the Army

As far as is known, the Chief of Transportation is subordinate to the Generalquartiermeister in all armies. Why was this not so in the German Wehrmacht? The source material at my disposal is insufficient for a lengthy historical analysis, so I shall have to base my writing on experience and memory.

As the Second World War has again proved, the railways are still the most important means of transportation for a continental power as regards both troop movement and economic transportation. At no time during the War did Germany have fuel enough to lighten the burden of the railways. Because of their peculiar character, the inland waterways were able to lighten the burden only to a limited extent.

All branches of the Wehrmacht accordingly made extensive claims on the railway system. The chief users were as follows:

a. OKW - Armed Forces Operations Staff

b. OKH - Operations Branch

c. OKH - Generalquartiermeister

d. OKL - Chief of Staff of the Luftwaffe

e. OKL - Generalquartiermeister

f. OKM

g. Commander of the Replacement Army

h. Military war economy agencies

i. Organization Todt

This list might also include the Chief of Transportation, for the railway engineers and the field railway troops, and the Reich railways, for coal required by the service and for private use.

If, therefore, the transportation system is subordinate to the Generalquartiermeister, one of its chief consumers will be able to decide on the requirements of other agencies having equal rights. This will result in prejudice to these consumers. Improvements and technical innovations will no longer be planned and carried out from the viewpoint of operations or adapted to overall conduct of the war.

Consideration must also be given to the fact that the railways are a technical undertaking, subject to characteristic influences of an imponderable nature. There is a danger that a military agency which does not work together with the railways in close relationship on a continual basis and which is unfamiliar with the technical aspects will not have the required amount of understanding of these technical factors.

3. Question of Transfer of the Military Transportation System to the Reich Railways

There were numerous attempts during the war to achieve this goal, especially at the time when decreasing manpower demanded personnel economies in all fields.

As has been explained in the first part of this report, it required great efforts on the part of the military before the Reich Ministry of Transportation and the Reich railways had converted from a purely peacetime organization to meet war requirements. By their very nature such things as operational planning and pressing military needs are far removed from the ways of thinking of the Reich railways people. If, then, they had assumed responsibility for military transportation they would of necessity have had to decide matters with which they could not have been familiar. This would have raised the danger that the technical requirements of the railways might be given precedence and justified demands by the Wehrmacht disregarded.

In conclusion it may be said that, in the situation prevailing in Germany, the independence of military transportation and its direct subordination to the high command was the correct solution. Only in this way could the needs of all three branches of the armed forces be adequately supplied by the Reich railways and the other means of transportation. This also ensured that the branches of the Wehrmacht were duly advised regarding the unchangeable factors connected with a technical enterprise. Another achievement was that it was not just one of the chief consumers which was made responsible for military transportation, but a distinct, independent military agency specially trained for this mission and familiar with all the exigencies of the matter.

II. Missions and Effectiveness

A. In the East

1. Russia

a. We had no detailed information regarding the Russian railway network, but on the other hand data of a general nature was available. Accordingly, all transportation agencies were preceded by investigators who advanced with the troops and whose mission it was to secure documents regarding the Russian railways and transportation agencies. The troops had been ordered to forward immediately documents connected with transportation matters to the transportation agencies.

By degrees, on the basis of personal investigation and the documents secured, an overall picture of the railway system in the territory occupied by us was obtained.

In the west of Russia the railways were rather efficiently organized, and their development was similar to that of West European railways. But in what condition were the railways? We had expected the installations to be demolished and the rolling stock carried off, but the actual situation exceeded anything we could have predicted. The Russians, who are past masters in demolitions and evacuation, had done a good job. Once the chief supply lines had been repaired in makeshift fashion, three new difficulties arose, as follows:

(1) The limited number of locomotives and freight cars.

(2) The astoundingly hard winter conditions.

(3) The activities of the Partisans.

b. The German high command was faced with the urgent need to convert the whole of the railway network in German hands to standard European gauge. Luckily the Russians had used wooden sleepers exclusively. Conversion would have been far more difficult had iron sleepers been used, and the time required, as well as the consumption of materials, greatly increased. As it was, we were able to use the same wooden sleepers, in so far as they had not been methodically demolished over lengthy sections.

Chief reasons for the conversion were the following:

(1) The number of wide gauge locomotives and freight cars found was far from sufficient for the traffic expected.

(2) No spare parts had been found, and the large repair shops had been emptied and demolished.

(3) If we had utilized wide gauge tracks, we would have had to build extensive transloading installations at the border. In order to do this we would have needed time and a large quantity of materials. The time required for transloading at the border would have had to be added to the time required by each train to reach its destination. A large number of personnel would have had to be permanently withdrawn from the front to do the transloading.

(4) The technical experience acquired during the conversion made it possible to greatly decrease the time needed for modification of the gauge, so that it was no longer an important factor in calculation of the overall time required to repair a section of track.

(5) The possibility existed of converting the freight cars which were available from wide gauge to standard gauge. In the course of

time, a great number of cars were thus converted. Because of their dimensions, however, they could only be used in Russian territory and were useless for through traffic.

(6) It was impossible, on the other hand, to convert the locomotives. This enabled Germany to give Finland a large number of wide gauge locomotives to build up Finnish railway traffic.

c. It soon became apparent that the railway network as repaired by us was inadequate to meet the high demands which the German command found it necessary to make during the course of the campaign. Accordingly, a vast program of new construction was organized and realized.

(1) The following requirements influenced planning:

(a) On railway lines running from East Prussia through the Generalgouvernement to Russia, a traffic of 220 trains daily was possible in addition to the internal requirements of these territories. It was the border-crossing of these 220 trains and their forwarding which made necessary the program of construction in Russia.

(b) An additional factor was the internal requirement of the occupied Russian territory.

(c) The requirements listed in (a) and (b) were the overall requirements.

(2) Special importance was attributed, aside from construction of the chief double - track lines, to the improvement of junctions. These large intersections of several lines were traffic bottle-necks; they had to be eliminated if objectives were to be attained. In this respect consideration

had to be given above everything else to creating facilities for the passage of large-scale troop movements.

Also, in addition to the available and extensive tracks running from East to West in the Russian network, a number of direct North-South connections had to be built. They were needed for large-scale shifts behind the front, and also for the interchange of commodities within the country and the transfer of commodities from the Ukraine to Baltic Sea ports, where they were transloaded onto ships, since maritime traffic was more economical and lightened the burden of the Reich railways.

(3) A large-scale improvement of technical station installations had to be effected. Innumerable modern coaling depots had to be organized, water supply points for locomotives built or improved, ramps constructed or enlarged and delivery roadways established. The modernization of the big railroad yards which were available greatly decreased the burden created by additional traffic.

(4) A matter of decisive importance for overall traffic was fundamental improvement of the railway communication service. The modern automatic long-distance connections of the Reich were at this time also extended to Russia and the lines increased and improved.

(5) Realization of this large-scale planning was attained through unremitting effort on the part of the German railway engineer troops, construction units and Organization Todt. The map included as Appendix # 3 shows what had actually been achieved. Construction of double-track lines had been aimed at maximum traffic; important single-track sections had been constructed accordingly. For months at a time, between 190 and 200 trains

actually crossed the border every day.

d. These achievements, however, were adversely influenced by winter conditions, partisan activities, the enemy air forces, and transfer of rolling stock, in parts of the southern areas, to Rumania.

(1) On the basis of the experiences gained during the hard winter of 1941-1942, a series of improvements were made to locomotives and technical installations. This action, taken at the instigation of the Chief of Transportation, resulted in a steady decrease in the number of losses. Snow-drifts played an important part. Joint employment of all available means and devices, such as the building of snow hedges and fences, snow-removing work on the part of troops and population and the use of snow-plows decreased the effects to some extent but did not succeed in altogether eliminating them. The fact that in winter a decrease of 15 % in performance was to be expected had to be taken into account.

(2) Commitment by the Russians of partisan troops had far more telling effect as far as the railways were concerned. From the very outset, definite points of main effort were noticeable. With the exception of the Pripet area, where the terrain was suited for such activities, there was no partisan warfare in the Ukraine. Even during the months when the Germans were withdrawing there was no serious trouble in the Ukraine, and the same may be said about the Baltic states. The situation was altogether different in the "old Russian" areas controlled by Army Group Center. Here extensive forests, limited roads and hiding places protected by swamps offered great advantages to the partisans. The length of the lines to be protected and

the lack of sufficient forces made it impossible for the German Wehrmacht to give adequate protection to the railways. Furthermore this underground war was carried on the Russians with brutality and unscrupulousness. The following list shows the number of attacks made on the railways in the area of Army Group Center:

Year:	Month:	Number of attacks:
1942	September	772
1943	February	393
	March	404
	April	626
	May	765
	June	841
	July	1114
	August	1392
	September	1256
	October	1073
	November	952
	December	779
1944	January	841
	February	907
	March	775
	April	1013
	May	1052
	June	1078

Losses in locomotives for all of the East ranged from 400 to 600 a month, including total losses, lengthy repairs and short repairs. In the Pripet area, partisan activity even led to complete shutting-down of all traffic on account of the lack of forces to guard the railways.

(3) In proportion to the results of partisan activities, the effects of bombing of the railways by the Russian air forces were negligeable. As a rule these forces attacked only lines and stations near the front, a situation which prevailed until the end of the war.

(4) The performance of the railway lines which it had been necessary to transfer to Rumania because of the political situation deteriorated to such an extent that German railway guards had to be committed to protect German transports, and even this method did not make it possible to achieve previous standards. In this territory, the political measures taken by the Reich had a hindering effect which worked out disadvantageously for the front.

(5) Special mention should be made of the fact that, until the last months of the German occupation in Russia, continuous and loyal cooperation was received from Russian railwaymen. In view of the enormous extent of the territory covered by railways under German control, it was impossible to have German personnel in all the jobs. In Russia, too, therefore, the greatest part of the low-ranking personnel was indigenous. Only in a few instances did the partisans succeed in winning over railwaymen to their side. This was due to the favorable effects of German measures for care and control.

2. Poland -- Performance and Improvements

With the occupation of Poland great improvements had been made to the railway network of former "Congress Poland." * In practice, however, performance was inadequate for the increased traffic from the Reich to Russia and also for the heavy internal traffic which the development of industry had called into being. In the years 1942, 1943 and 1944, accordingly, additional building of lines, stations and especially junctions had to be undertaken. The most important projects were the following:

a. Construction of double tracks on the Posen-Kutno line.

b. An increase in the traffic capacity of the junctions of Warsaw, Lublin and Starzysko-Kamiena.

c. Completion of a new, double-track West - East through line, Kalisch - Koluszki - Radom - Deblin - Lublin. It was possible to carry out only part of this project.

d. Construction of another Vistula bridge at Muensterwalde.

e. Thorough improvement of the big line from Cracow to Lemberg, in order to bring its capacity up to that of the principal German lines.

f. Up to the time of the evacuation of Lemberg it had been possible to build a line detouring the city only in part.

g. Increased performance on the so-called "oil railway" lines, Lemberg - Cernauti - Rumania.

In addition to these important projects, a series of single-track lines and a great number of stations were extensively improved. Worthy of

---

* Poland as it was established by the Congress of Vienna; Russian Poland.

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special mention is the fact that up to the end of the war German railway personnel in Poland amounted to only about 12 percent of the total. In spite of this the Generalgouvernement was exempted from attacks by partisans until the moment when the frontline ran through its territory. Even then, however, the Polish personnel did its duty faithfully.

B. South-East - Performance and Improvements.

1. Hungary

In the second half of the War, the Hungarian railway network played an ever-increasing part in the plans of the German command. Its importance was two-fold. It provided a route for traffic to South Russia and also for traffic to the Balkans. For this reason the Hungarian State Railways were supported by means of allocations of locomotives and deliveries of coal. Moreover, German railway reconstruction crews were committed to repair damages, so that the performance of lines running over the Carpathian Mountains to Eastern Rumania was considerably improved. There was a daily traffic through Hungary of approximately 50 trains, which were restricted to German use.

The cooperation of Hungarian railway officials was very good. Although performance in the mountainous parts of East Hungary did not meet German requirements, the Hungarian railway officials constantly tried to fulfill German demands.

2. Slovakia.

Transit routes through Slovakia were of great importance to the German command. The performance of the lines in Slovakia was good and the cooperation of the State Railways excellent.

3. Rumania.

It was very important to the German command to be able to use the Rumanian lines for traffic to and from the Russian southern front. In addition to this there was the question, decisive for the war effort as far as the Reich was concerned, of the oilfields. Rumania was aware of this and was able to obtain German equipment and material to improve its railway network to a pronounced degree. Performance, however, was definitely lower than that of the Hungarian and Slovakian railways. Thanks to the skilled work of the transportation agencies committed by Germany in Rumania, it was possible to improve a number of weaknesses. In this regard, it was particularly difficult to stop Rumania from improving only those railway lines in the interior of the country, thus serving its own interests and using the large numbers of locomotives which it had obtained on loan for its own purposes.

4. Croatia - Serbia.

After occupation of the country had been completed, the railways were taken over by the German military government. For this purpose the "Wehrmacht-

Verkehrs-Direktion" [Armed Forces Traffic Branch] in Belgrade was established, with a number of subordinate field railway headquarters. Here, also, the indigenous personnel cooperated voluntarily. In no way, however, did performance meet the requirements of the German south-eastern front. Therefore, large-scale improvements were undertaken. The main line from Belgrade to Saloniki was greatly improved. On account of the mountainous character of the country, this was difficult. The line's capacity was increased to 24 trains a day. In practice this capacity was never attained, because partisans continually wrecked the tracks and the Bulgarian guard units committed there failed to prevent this sabotage.

As a result of the unbelievable political situation prevailing in Croatia, the activities of the partisans were even greater there. This led to lengthy daily interruption of the service, so that regular traffic was impossible even on the main line from Agram to Belgrade.

Later, Allied bombing attacks were particularly effective as regards the lines in this area. The indigenous personnel, already intimidated by the partisans, was terrified by the Allied bombers.

5. Greece.

In peacetime the railways were not of essential importance in Greece, since most of the economic traffic was carried on by overseas and coastal shipping. All at once, as a result of Allied naval superiority, the low-capacity railways had to take over transportation on an overall basis. In addition to the fact that construction, methods, rolling-stock and personnel were insufficient to meet such requirements, the main line from Saloniki to Athens had been constructed at the end of the previous century as a sort of panoramic railway, to prove that it was possible to build railways even over difficult and mountainous terrain. As far as is known, this line had a daily capacity of 12 half-trains, with a useful load of 300 tons.

In order to meet the requirements of the command as far as possible hard and continuous work improved the line to such an extent that it could carry 12 whole trains. This was one of the greatest achievements of the German railway construction units. The vulnerability of this line to sabotage was still a problem, although Greek railway personnel willingly collaborated. As a result of interference by the Italian occupation authorities, performance gradually fell off.

C. Italy

I have described the railway transportation situation prevailing in Italy in a special report from Garmisch, on 8 April 1947.

D. In the West

With the exception of the network of the Iberian peninsula, the West European railway network meets the highest modern requirements, as far as its overall installations, equipment and methods of work are concerned. The damage done by war in 1940 was soon repaired. It is worthy of mention that, after termination of that campaign, French railway engineer troops did excellent work in repairing the railways. The results of the reconstruction work were such that from the end of 1940 until the fall of 1943 all requirements of the military command could be met without difficulty.

The only threat on the horizon was the coming mass commitment of Anglo-American air forces in connection with the expected Allied invasion. In order to counteract the effects of mass air attacks, the Chief of Transportation made preparations to ensure that transportation would continue in the required capacity in spite of the extensive damage which was bound to result. The experience necessary for this purpose had been acquired in Italy. Preparatory measures were taken beginning late in the summer of 1943. First, all transportation agencies were strengthened with a cadre of officers having front-line experience, and leading positions were taken over by officers especially trained for the purpose. Special importance was attributed to the theoretical preparation of stop-gap measures to cover all branches of transportation, and all individuals and agencies concerned were given thorough training. The mobilization in sufficient numbers of personnel of the Reich railways was prepared according to a mobilization plan; their transportation even in case the railways were unusable had been provided for.

In case of need the railway engineer troops, whose numbers were limited, would have been strengthened by the addition of units from other theaters of war. The acute need for them in the other theaters made it impossible to bring these men west in advance of an emergency.

Two projects had pronounced detrimental effects on traffic in the West. These were the increased work connected with improvement of the Atlantic Wall and the dislocation and shifting of big industry. Both measures had been initiated without the knowledge of the Chief of Transportation. Internal French railway traffic increased greatly on account of the very high requirements of both projects. A factor which was particularly harmful was that large transports of building materials had to be routed through districts lacking in communications as for example Brittany. It was clear that continuous over-straining of the facilities would inevitably lead to difficulties which it would take a long time to overcome; the easy flow of traffic was impaired, a pronounced back-log set in. As a result there was again a need of locomotives and cars. Only after lengthy and difficult negotiations — in the West the Chief of Transportation was merely one consumer among others — between the Chief of Transportation and the transportation agencies in the West, was it possible to decrease the over-straining of the facilities to the point where it was bearable. As of March, 1944, the situation of the railways in the West may be described as follows:

1. A railway network capable of handling transportation on a large scale was available.

2. In March, 1944, the rolling stock and the number of locomotives available in the West was sufficient. If an apparent tightening had set in, this was due to bottlenecks in the traffic, inasmuch as the over-straining had increased the time required for the cars to return to their starting-points. To parry Allied mass air attacks, return of the French locomotives in use in the Reich had been prepared on the basis of a mobilization plan.

3. As a result of the exaggerated use of coal by all consumers, the situation had become more critical. As a comparison, it may be mentioned that West European railways disposed of a stock of coal sufficient for ten days ahead, while the German Reich railways had stocks sufficient for from twelve to twenty days ahead. In the as yet unoccupied part of France, however, considerably higher stocks were available.

4. The pronounced over-taxing of Belgian and French railways through the transportation of building materials for the Atlantic Wall was alleviated to a degree which made it bearable by means of the efforts of transportation and railway agencies to secure additional facilities from the French interior.

5. In the main, military demands for transportation of any nature were fulfilled.

6. It was possible to remedy the effects of air raids which had taken place up to this time; detours such as were necessary did not occasion lengthy delays.

7. Preparations had been made to alter the whole pattern of railway traffic when Allied mass air attacks began.

8. It was impossible to bring up the railway construction units so desperately needed and to put railway traffic personnel in a state of alert before the attacks had actually started, because this would have conflicted

with the overall framework set up for conduct of the war.

The effects of Allied air attacks on West European railways are described in Section III of this Chapter.

E. Reich and Protectorate

The railway network of the German Reich fulfilled all requirements made by the military. As far as performance is concerned, the Reich railways rated very high. Naturally, there were traffic bottlenecks even in the Reich, but they were known and could accordingly be avoided by careful management.

The unexpected expansion of the war soon brought about a definite scarcity of locomotives. The need for locomotives was increased by the fact that great numbers of locomotives were lost as a result of partisan activities, the effects of winter, and finally because Allied air attacks made it necessary to furnish locomotives to other countries. To remedy this situation a vast new construction program of locomotives was planned. It was followed for a few months but then it had to be abandoned in favor of more urgent projects.

Up to the last years of war the Reich railways received every consideration from the Wehrmacht as far as drafting of its personnel was concerned. The number of employees increased through the enlistment of female personnel, but the value of performance fell off as a result of this. An additional burden for the Reich railways during the war was the necessity of giving up large numbers of skilled labor for work outside of the Reich.

In the Protectorate, the railways remained, as before, separate from the

Reich railways, having their own administration and with only a few leading posts occupied by German personnel from the Reich. It is worthy of mention that the Czech personnel continued to do its duty willingly and properly until the very last days of the war, so that even in the last days of April and the first days of May, 1945, large troop movements across the Czech network were still possible.

III. Effects of the Air War and Countermeasures

In the second half of the War, the railways of the Reich and the territories under German influence were exposed to increasingly destructive attacks from the air.

There is a clear difference between the effects of Russian and Allied air attacks.

A. Effect of Russian Air Attacks

Up to the end of the War, it had not been possible for Russian air forces seriously to hamper operation of the railways by means of air attacks. In general, the Russians made attacks only on stations situated immediately behind the front. Damage was relatively easy to repair. Repeated air attacks on the big bridges over the River Dnieper, for instance, were unsuccessful, except that a particularly unfortunate direct hit on the Narva Bridge did serious damage. Even in the last months of the War the very active railway traffic behind the front, especially in the region of Stettin - Berlin-

Kuestrin - Frankfurt-on-the-Oder was never at any time disrupted by Russian air attacks.

Attacks on locomotives by fighter planes did not take place.

In conclusion, it may be said that the effects of Russian air attacks on railways were negligeable. Up to the last days of the War, the Russian air forces were unable to exercise any sort of operational influence.

B. Effect of Allied Air Attacks

Mass attacks by the Allied air forces against the railways had always been expected. The Chief of Transportation noticed that the Allies carried on their air war against the railways in Italy, in the West and in the Reich in such a way that the point of main effort was always directed against districts relatively close behind the front against which an attack was projected.

In Italy, the defiles which were of decisive importance for railway traffic, the Brenner pass and the Po lines, were attacked in strength only beginning in July, 1944. Had these attacks been made in the summer or the fall of 1943, it would have been impossible to undertake troop movements from Germany to Italy or to maintain a continuous supply service on a large scale. This might have resulted in a much quicker breakdown of the German front in Italy.

Beginning in March, 1944, and up to the landing in Normandy, all large stations and all lines and bridges in a general line running from Namur to Brussels to Paris and from this point down the Seine River to its mouth were effectively damaged. This made it possible to move up reinforcements from the Reich as far as the Nancy district and the caterpillar elements of the Panzer divisions up to the district south-west of Paris. It was also possible to reach the invasion front from the South of France across the Loire River, since at the beginning of the invasion a number of railway bridges across the Loire still stood and since loading and unloading could be done in other places.

In June 1944, the situation of the railways in the Reich was still such that troop and supply transportation was hardly affected.

C. Effect of Air Attacks on Railways During Preparation and Execution of the Eifel Offensive.

In spite of Allied air attacks, bringing up of attack divisions and of GHQ and army troops proceeded according to schedule. The stock-piling of supplies which had been ordered was likewise carried out as planned. During execution of the Eifel offensive the bringing-up of troops and supplies to the unloading points previously foreseen east of the West Wall was as a rule also carried out according to plan. It was not possible for railway transports to go beyond the West Wall because repairing of railways west of the West Wall had not been finished in time.

D. Results of Air Attacks on the Railways in the West Between the Fall of 1944 and May 1945.

The extremely heavy air attacks on railways increased the difficulties of military transportation, although, through the use of stop-gap measures of all kinds, an attempt was made to alleviate the effects. Because of tighter control and because they had a better communication network, the military agencies had an easier time of it than the civilian offices.

The most important of the measures used for defense against air attacks was to have the trains run at night. Beyond a line extending from Bremen over Kassel to Ulm, all military transports operated only at night. Only if poor visibility prevailed were runs made during the daytime. Thus, in practice it was possible to effect transportation of replacements and current supply needs up to the unloading districts east of Aachen, around Kall-Junkerath, east of Trier and in the Saar region. As a rule, larger troop transports could be brought up only as far as the Rhine, caterpillar units as far as east of the West Wall, It was very difficult to carry out displacements behind the front, and frequent disruption of the lines led to long delays.

Naturally, traffic of goods important for the war effort and civilian railway transportation suffered much from the results of the bombings. Operation of the Reich railways was made very difficult as a result of the congestion of the network by stalled trains and rolling stock which had flowed back into the Reich from lost territories. After the deep breakthroughs made by the Allies into Central Germany the traffic situation became increasingly worse, inasmuch as through North-South connections were lacking. In spite of the particularly heavy air attacks on railways in the South of Germany, it was possible to maintain communications between Wurttemberg, Bavaria, and Upper Austria up to the last days of the war.

IV. General Summary of Performance During the Second Half of the War.

A. Troop Movements.

The time of large-scale assembly of troops for action was past. In its place there was the shifting of troops from one theater of war to another, transportation of battle-weary divisions into the Z.I. or to occupied territory and transportation of newly activated units to the front. The extent of the distances to be covered, in contrast to those within the small territory of the Reich, demanded a pronounced increase in personnel and material. The transportation network had to cover terrain extending from the Atlantic and the Spanish border to the Caucasus and west of Moscow, from Denmark to Italy, the Balkans and Athens.

Railway lines capable of uniform performance were selected for this purpose, which, in their whole run, only crossed other lines, but did not cover the identical stretches. Each of these lines was given a different color. In this way, even when great distances were concerned, orders were simplified and clear.

Troop movements were watched with close attention to ensure swift arrival of the troops at their destination and immediate return of the rolling stock after unloading had been completed.

The time required from the order to carry out the transportation to the moment when the first train actually left was constantly shortened. From 1943 on, it was possible to begin shifting of a division six hours after the order had been received at headquarters. Often the time was so short that the troops had not finished preparations. During the years from 1942 to 1945, divisions and GHQ troops, as well as formations of the Luftwaffe, were constantly shifted in this way from the Reich to the various fronts or back into the Reich. Large concentrations for the various offensives in the East and for the big defensive battles were carried out. Individual divisions and GHQ troops were transported to and from the eastern front almost without interruption; behind the eastern front the Eleventh Army was transported from the Crimea right across Russia to Leningrad. Exchange of divisions behind the front took place, too. From Norway and Finland, troop movements to the Balkans, the East and the West took place. After rehabilitation, divisions were transported from France to the East, to Italy and Greece. Formations in Crete and the Ionic Islands changed places with formations in the North of Norway and Finland.

Special efforts were required for the rapid assembly of Rommel's group of armies in southern Germany, in southern France and in Austria after the defection of Italy. On short order the railways in German-occupied Italy had to be taken over by our own administration.

In spite of the Allies' air superiority in the West, concentration of troops for the Eifel offensive went off smoothly, and as late as January and February, 1945, the Sixth Panzer Army was transported from the West to Hungary and Eastern Germany on the basis of sixty trains a day. All these movements were, as a rule, completed without any delays.

These performances of the transportation and railway agencies were made possible through the availability of the very good communications net of the military transportation agencies, the wire net of the Reich railways and the very great cooperation of all agencies.

Naturally, trains of "empties" had to be kept in readiness in all districts. These amounted to a maximum of 400 trains, comprising 22,000 cars. Withdrawal of these railway cars from circulation did not impede normal traffic.

B. Transportation of Individual Units

The longer the war lasted the more the number of individual units to be transported increased. These movements took place everywhere in the Reich and the occupied territories. There was a great increase in the number of shipments of personnel replacements. Their arrival was always urgently awaited. In districts where transportation was over-taxed, the daily number of individual unit transports had to be predetermined, which is why movements of individual units were restricted to limited daily distances.

C. Leave Traffic

The longer the War lasted the more important became the question of leaves. The Chief of Transportation always regarded it as one of his most important missions to get the men who were on leave home and back to the front again without their having to make many transfers.

A special railway network for leaves was created. Because direct transportation into the Reich was impossible for a number of reasons, such as delousing, monitoring of traffic, etc., through trains were routed from stations situated favorably in respect to the front up to the Reich borders.

The departure stations at the front were reached by means of shuttle trains. Large relay stations at the Reich borders took care of the control and medical inspection of the men. From this point the Reich leave trains took over. The network was tight and regulated in such a way that men on furlough from any one front were able to reach their home towns without delay. In the East some twenty trains daily were devoted exclusively to leave traffic. In the Reich 200 Wehrmacht leave expresses ran daily, and 150 Wehrmacht "partial" trains connected with through trains for general use. The only special difficulties connected with leave traffic occurred in the area controlled by Army Group Center in Russia, as a result of partisan activities, and in the Balkans where the situation of the railways was unfavorable.

In spite of everything it was possible in 1943 to give one leave each in approximately five months, to all the men on the eastern front, including those of the rear zone. After six months the number of the soldiers on furlough counted at relay stations in the East corresponded to the total number of the soldiers and other Germans in the East. As a result of the situation at the front the number of soldiers given leave decreased later on.

Leave actually began from the moment the chief relay station at the Reich border had been reached; from this point the fourteen days' leave received by a soldier began, but he received an additional one to three days for travel time within the Reich.

Special attention was given to the problem of protecting leave traffic from air raids. This led to a separation between relay stations for the incoming and outgoing service. Because of these precautions very few losses were sustained throughout the entire duration of the war as a result of air attacks; Wehrmacht leave traffic had a reputation for being very safe and reliable.

D. Supplies.

During the war a shift in the proportion of troop traffic to supply traffic took place. In the beginning, the number of troop trains was substantially greater than the number of supply trains. The demands of the supply service increased as the War went on. The work of the Ib group of the Field Transportation Branch increased proportionately. Moreover, the work connected with supply trains is more difficult than that connected with troop trains. The Ib group had to be constantly expanded. The message service steadily increased.

In view of the Reich's difficult supply situation it is hardly surprising that all available weapons and all available equipment were pressed into service. Furthermore, the great mass of the German Army was not motorized, but horsedrawn. Forage in great quantity had to be transported to feed all these horses.

All in all, we had about eighty different types of supply trains. All efforts to decrease the number failed because of the overall supply situation. For the railways, however, this was a great burden.

In addition to this, the high command was inclined to order supplies for the front in an extravagant fashion. The result was that when the situation varied frequently, as on the Eastern front, the railways had to provide an enormous quantity of supplies which, when evacuation took place, had to be transported all the way back again, and this under pressure!

In order to achieve a closer control of current supply movement, the supply trains, too, were grouped together. This also prevented them from being pushed completely aside by troop trains when there was trouble on the line.

In territorities which were over-taxed, the great demands for supplies could often not be met. This situation was relieved by taking at least part of the supplies from the district itself so that transportation distances were shortened.

When preparations were made for a large-scale offensive the Generalquartiermeister was in principal given a special quota of trains for the first delivery of supplies, and these trains were set in motion at the earliest opportunity.

Supplies for the Luftwaffe and, to a limited extent, those for the Navy were likewise arranged by the Ib group in collaboration with liaison officers from both branches. Friction resulted from the fact that the demands of the Luftwaffe were often made without due warning, but these difficulties, too, were smoothed out.

All hospital trains were under control of a senior medical officer in the Personnel Branch of the Chief of Transportation. Operation of these transports was also undertaken by the Ib group.

E. Initial Organization Transports for New Units

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E. Initial Organization Transports for New Units.

A large number of initial organization transports had to be run for the constantly increasing number of newly activated units. As long as the situation in the air did not affect railway traffic, these transports went through without difficulty. When, however, serious damage was done, the over-hasty decentralization of industries which had been carried out produced unfortunate results. Demands were made upon the transportation system which could not possibly be carried out. For example, when a division was newly activated in Jutland, its optical equipment had to come from Graz. To run this single goods car right across the Reich in anything approaching peacetime schedule was impossible, in view of the over-taxed traffic situation prevailing on Reich railways. The unit itself received only a very limited time for activation. Its readiness for action depended upon the punctual arrival of the optical equipment. There was a discrepancy here which it was impossible to overcome. This and other similar reasons gave rise to serious friction.

V. Special Questions.

A. Measures Taken to Curtail Transportation Demands.

Throughout the war Germany suffered from a scarcity of fuel. One of the results of this situation was that the railways carried the chief burden of traffic. Demands were placed upon the railways which were unequalled anywhere else. Inasmuch as the necessary fuel was not available, the Reich autobahns, which were exceptionally suited for operational shifts on a large scale, and other good Reich roads were not used for movements of motorized formations.

After the Russian oil wells had been lost, only the Rumanian oil wells and our own produce was available. As a result, the roads were used even less than before. After the defection of Rumania new and severe restrictions were instituted. It is accordingly no wonder that even when short distances were concerned armored divisions and motorized divisions as well as mechanized GHQ troops had to be transported by railway. In contrast to Russian practice, in general long-distance marches were not made by infantry divisions, inasmuch as the time available before their commitment did not as a rule suffice to enable them to travel by road. Finally, during the transition periods in spring and fall the road net in the chief theater of war, Russia, was utilizable only to a limited extent.

Steps had accordingly to be taken to curtail transports by railway. The most important of these were:

1. A reduction in the number of trains.
2. An increase in the load capacity.
3. Decentralization of transports.

During the first half of the war the number of trains required to transport a division by rail was very high. A factor of prime importance was that each division had its own supply troops, whose activities were many-sided. When a division was battle-weary, transportation of the combat elements of a division required only a limited number of trains, while the supply services had to be transported almost in full. All attempts by the Chief of Transportation to achieve a basic organizational change failed. Another way out had to be found. The idea was adopted of dividing divisions into a combat and supply echelons. The combat echelon included all combat elements and a limited portion of rearward services required in the early stages of the fighting. The supply echelon included the major part of the rearward services.

The number of trains required to transport the combat echelons of all divisions was now so small that detraining of the combat echelon of an infantry division at maximum tempo required about one day and at minimum tempo around two days; detraining of the combat echelon of an armored division at maximum tempo required two days, at reduced tempo three days.

An increase in the load capacity was attained by means of the "overloading" system. Sub-sections of two and three cars were organized in a transport train. Within these sections a vehicle was loaded in such a way that it protruded over the buffers. This permitted each car to be loaded with additional vehicles. An average saving of 12 to 14 percent was attained in this way; and when movements of several divisions were concerned this percentage became an important factor. However, orders were given to use this space-saving system even in small shipments. Thorough briefing of the troops in this respect prevented large-scale traffic disruption as a result of inefficient loading practices.

In addition to utilizing the "overloading" system, the troops were required to load trains to capacity. The inclination of the troops to utilize more and more cars as the war went on was discouraged at the loading stations by means of rigid controls; the troops received the number of trains authorized to them; any additional requests were met only after careful investigation.

The Chief of Transportation had participated in conferences regarding decentralization of transports even before the war. The question was neglected during the war until necessity made action imperative. The question of who was to give the decisive orders made for serious difficulties, inasmuch as each consumer rebelled against an infringement of his own authority. Finally an agency charged with decentralization of transport within the whole Wehrmacht was created in the OKW. This agency worked in close association and on good terms with the Chief of Transportation; the latter was indebted to this agency for a great many measures leading to curtailment of the number of railway transports.

B. Allocation of Capacity to Consumers

The demands which all branches of the Wehrmacht made upon the railways were often greater than the means of transportation which were available. This caused serious friction. The difficulty was increased by the division of the operational conduct of war into OKW theaters of war and OKH theaters of war, which had very disturbing effects on transportation.

The chief difficulties arose in the East. They existed in the Balkans, too, however, and in Italy; and from 1943 on there was the same sort of trouble in the West.

As far as the Eastern Theater of War was concerned, decisions were made in regard to distribution of the available transportation by the Chief of the Operations Branch and, in special cases, the Chief of Staff. The justified demands of the Luftwaffe, the Navy and other consumers who did not belong to the Army were naturally considered in this respect. All these negotiations were difficult and took time. The greater the general need was, the greater the demands, often exaggerated, of the high command, the more the Chief of Transportation was required to do.

What was essential was that this arrangement should always prove effective. Thanks to unbiassed management the absolutely necessary requirements of all consumers were met. In the Balkans and in Italy arrangements were made by the commanders-in-chief of these theaters of war.

In the West, the General of Transportation attached to O.B.West took care of military requirements. Details regarding this are contained in the reports regarding O.B.West.

C. Measures Affecting Traffic

The experiences of the War showed that while the maximum capacity plan was suited to the initial assembly for war it was not suitable for application during war. In addition to the demands made by the military upon the Reich railways there were the enormous demands made by war economy and civilian traffic. During the entire period of the war the greatest efforts of the Chief of Transportation were concentrated on preventing military demands from interfering too much with the needs of other consumers.

Towards the end of the War, the Chief of Transportation abandoned the maximum capacity schedule altogether. Actually, it had not been applied since 1942. Instead, a revised version of the general schedule was adopted. This made it possible to undertake even large-scale troop movements without greatly curtailing general traffic.

Civilian traffic and, later, war economy traffic, too, suffered much more from the effects of the enemy's air warfare. Even then, however, the Chief of Transportation tried to do what he could to help.

VI. Internal Waterways and Road Traffic

In order to relieve the railways, freight shipments that were not urgently needed were transferred to the internal waterways.

As mentioned in Part I of this report, the Reich internal waterways net was unable to recover from the severe blows it had sustained during the first part of the War. The untiring work of the "Dienststelle fuer Transportordnung" [Office for the Organization of Transportation] made it possible to use the internal waterways to a greater extent. Still, the increasing damage done to the internal waterways by Allied air attacks again created obstacles.

"Feldwasserstrassen-Abteilung*" [waterway battalions] were organized for the internal waterways of the occupied territories.

In the East great difficulties arose because the rivers were not regulated. In the Pripet area the partisans, who were favored by the terrain, dominated extensive districts, preventing regular traffic. At first, navigation on the big rivers within the area controlled by Army Group South proceeded smoothly. Then came setbacks at the front; the front receded, and fighting took place in the neighborhood of the rivers.

In the West, in Holland and in north-western France, an active supply traffic developed on the waterways. The railways were accordingly relieved of an important part of their burden.

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* Feldwasserstrassen-Abteilungen were engaged in clearing and maintaining waterways which were essential for military transport.

In the South-East, the Danube played a special part. Control of all military shipping on the Danube was in the hands of the Wehrmacht Transportation Command for the South-East, in Vienna. Navigation facilities were utilized to the limit. Only in this way was it possible to ship large quantities of oil and most of the grain from Rumania to the Reich.

The increasing commitment of Allied air forces against navigation on the Danube, especially the dropping of river mines, seriously delayed traffic, although it did not altogether paralyze it.

As far as the development of through roads was concerned, the chief emphasis lay in the East. In Russia, Hungary, Rumania, Greece and Serbia, through roads were developed by hard work and by methods costing a great deal of time. Unfortunately we were not able to profit from these roads, which were lost to us when the front receded.

VII. Conclusion

In the second half of the War, military transportation was on the defensive. The chief difference between the two halves of the War was that up to the end of 1941 all railway transportation in territorities controlled by Germany operated without great interference by the enemy.

As the War continued, however, enemy action increased until finally the Allied air war seriously menaced the railways and their operation. During these difficult last years of the War, military transportation accordingly had to be adapted to the increasingly serious situation. All forms of transportations were requisitioned for the war effort, and yet everything had to be carried by the railways.

Rapid evaluation of experience gained in the field of transportation led to its immediate application in practice. Only thus is it possible to explain that, up to the last months of the gigantic struggle against overwhelming might, it was still possible to carry out extensive troop movements and current supplying of the troops, insofar as supplies were still available, in spite of the Allied air attacks.

Although every engine-driver and stoker of a military train had to risk death as a result of dive-bomber attacks, he continued to do his duty for the Fatherland. And this is true of every German women and man working for the Chief of Transportation and the Reich railways.

Chief Army Transportation Officer

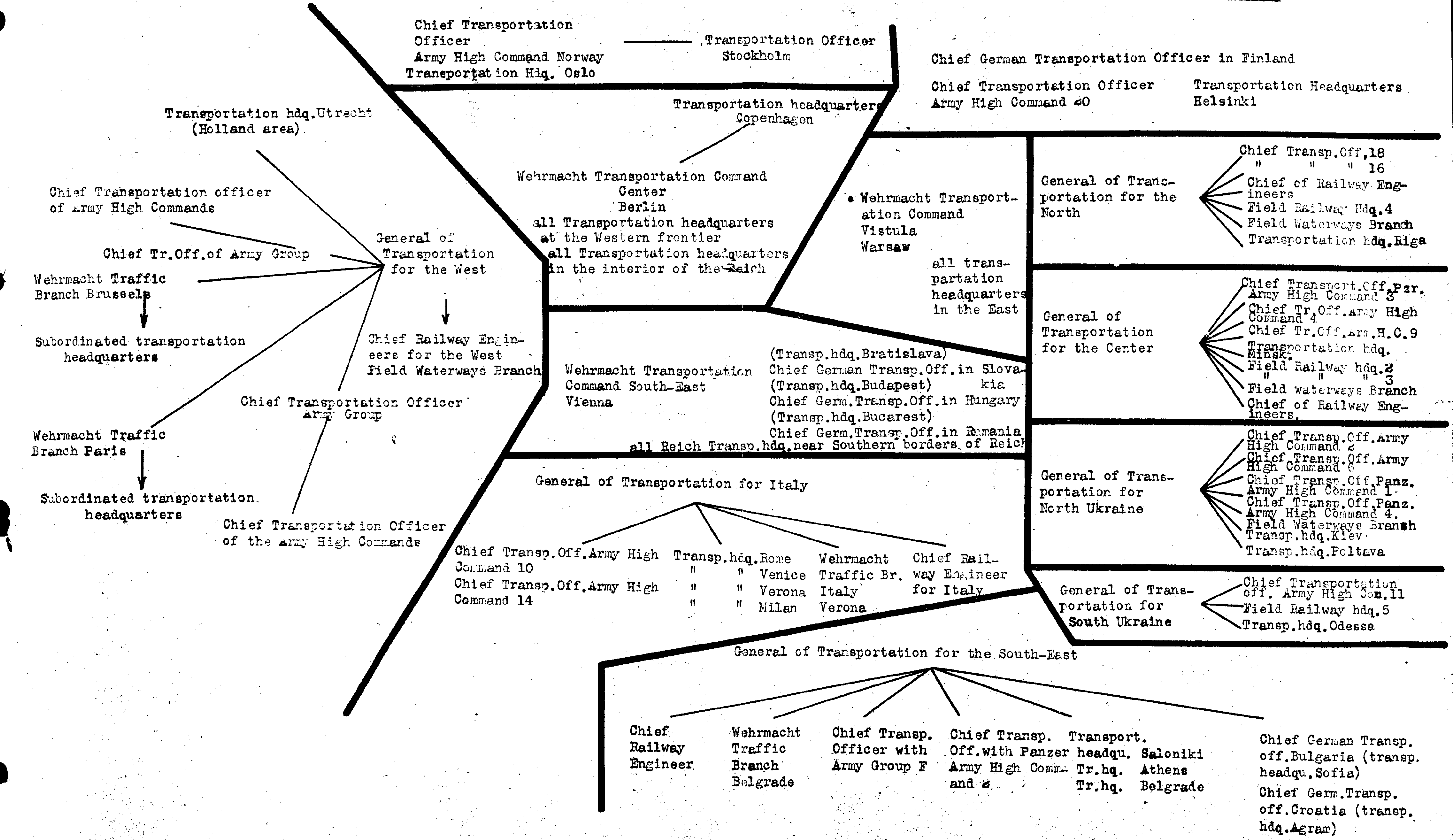
Adjutant of Chief of Transportation Headquarters OKH	Authorized General of the Chief of Transportation Headquarters OKH	Field transportation Branch Headquarters OKH	Planning Branch Headquarters OKH	Traffic Branch Berlin	Personnel Branch Headquarters OKH	General Staff Liaison Officer with Wehrmacht Operations Staff Field Headquarters	Subordinated Branches

Higher Transportation Agencies a) General of Transportation b) Wehrmacht Transportation Command c) Chief German Transportation Officer d) Chief Transportation Officer Army High Command Norway e) Chief of Transportation Home Staff Uebersee	Wehrmacht Transportation Schools Transportation Instructor at the Military Academy	Chief of Railway Engineer troops Headquarters OKH		Higher Transportation agencies directly subordinated

Liaison Officer of the SS Central Department (attached to Field Branch) Headquarters OKH	Liaison Officer of the Organization Todt (attached to Planning) Headquarters OKH	Branch L of the Reich Ministry of Transportation with Transportation Chief Headquarters OKH	Liaison Officer of Lufwaffe Figh command with Transportation Chief Headquarters OKH	Liaison Officer of Navy High Command with Transportation Chief Headquarters OKH		Liaison Officers and agencies with Transportation Chief

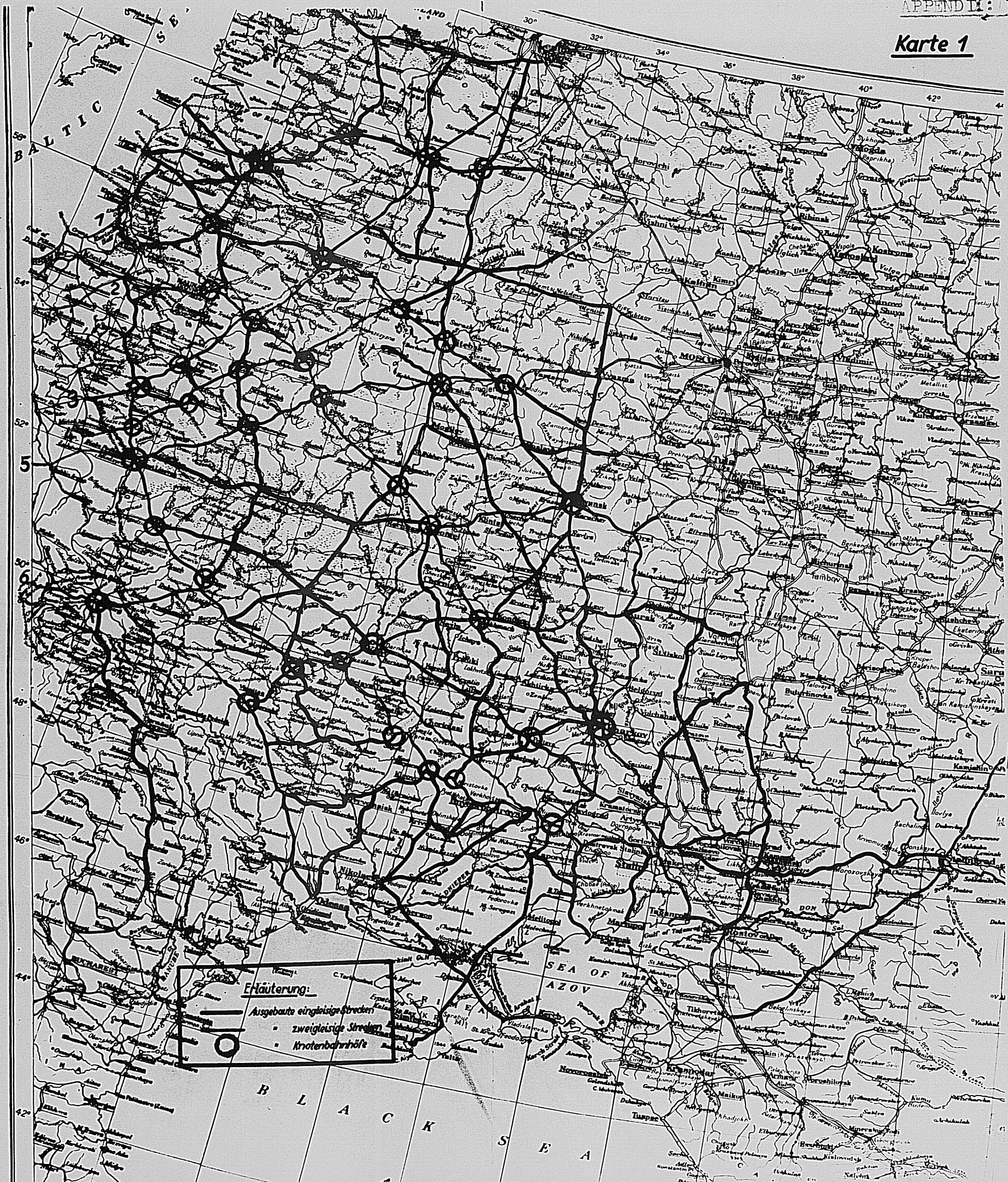
TOTAL STRENGTH:	4.000 Officers	10.000 Transport agencies
	100.000 Men	40.000 Field railway units
		50.000 Railway engineer and construction units (exclusive of Organization Todt.

APPENDIX 8

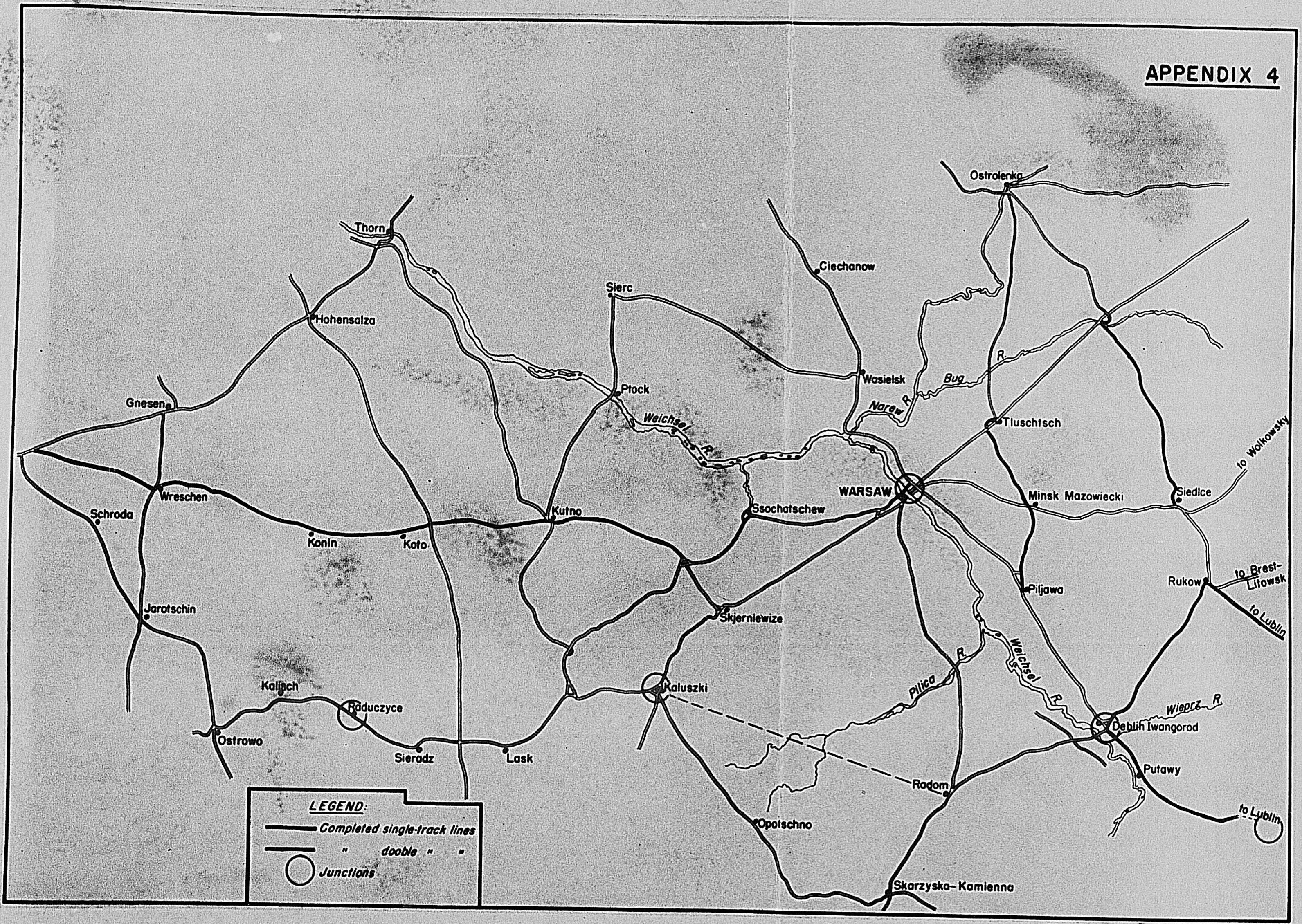

Chief Transportation Officer
Army High Command Norway
Transportation Hiq. Oslo
Transportation Officer Stockholm
Chief German Transportation Officer in Finland
Chief Transportation Officer Army High Command 20
Transportation Headquarters Helsinki
Transportation headquarters Copenhagen
Transportation hdq.Utrecht (Holland area)
Wehrmacht Transportation Command Center Berlin
all Transportation headquarters at the Western frontier
all Transportation headquarters in the interior of the Reich
Wehrmacht Transportation Command Vistula Warsaw
all transpartation headquarters in the East
General of Transportation for the North
Chief Transp.Off,18
" " " 16
Chief of Railway Engineers
Field Railway Hdq.4
Field Waterways Branch
Transportation hdq.Riga
Chief Transportation officer of Army High Commands
Chief Tr.Off.of Army Group
Wehrmacht Traffic Branch Brussels
Subordinated transportation headquarters
General of Transportation for the West
Chief Railway Engineers for the West
Field Waterways Branch
General of Transportation for the Center
Chief Transport.Off.Pzr. Army High Command 3
Chief Tr.Off.Army High Command 4
Chief Tr.Off.Arm.H.C.9
Transportation hdq. Minsk.
Field Railway hdq.2
" " " 3
Field waterways Branch
Chief of Railway Engineers.
Wehrmacht Transportation Command South-East Vienna
(Transp.hdq.Bratislava)
Chief German Transp.Off.in Slovakia
(Transp.hdq.Budapest)
Chief Germ.Transp.Off.in Hungary
(Transp.hdq.Bucarest)
Chief Germ.Transp.Off.in Rumania
all Reich Transp.hdq.near Southern borders of Reich
Chief Transportation Officer Army Group
Wehrmacht Traffic Branch Paris
Subordinated transportation headquarters
Chief Transportation Officer of the army High Commands
General of Transportation for North Ukraine
Chief Transp.Off.Army High Command 2
Chief Transp.Off.Army High Command 6
Chief Transp.Off.Panz. Army High Command 1
Chief Transp.Off.Panz. Army High Command 4.
Field Waterways Branch
Transp.hdq.Kiev
Transp.hdq.Poltava
General of Transportation for Italy
Chief Transp.Off.Army High Command 10
Chief Transp.Off.Army High Command 14
Transp.hdq.Rome
" " Venice
" " Verona
" " Milan
Wehrmacht Traffic Br. Italy Verona
Chief Railway Engineer for Italy
General of Transportation for South Ukraine
Chief Transportation off. Army High Com.11
Field Railway hdq.5
Transp.hdq.Odesse
General of Transportation for the South-East
Chief Railway Engineer
Wehrmacht Traffic Branch Belgrade
Chief Transp. Officer with Army Group F
Chief Transp. Off.with Panzer Army High Command 2
Transport. headqu. Saloniki
Tr.hq. Athens
Tr.hq. Belgrade
Chief German Transp. off.Bulgaria (transp. headqu.Sofia)
Chief Germ.Transp. off.Croatia (transp. hdq.Agram)

APPENDIX: 3

Karte 1



APPENDIX 4


Ostrolenka
Thorn
Ciechanow
Sierc
Hohensalza
Wasielsk
R.
Bug
Narew R.
Ptock
Gnesen
Weichsel R.
Tluschtsch
to Wolkowsky
WARSAW
Siedlce
Wreschen
Minsk Mazowiecki
Schroda
Kutno
Ssochatschew
Konin
Koto
Piljawa
Rukow
to Brest-Litowsk
Jarotschin
Skjerniewize
to Lublin
R.
Weichsel R.
Pilica
Kaluszki
Wieprz R.
Kalisch
Raduczyce
Deblin Iwangorod
Ostrowo
Sieradz
Lask
Putawy
Radom
Opotschno
to Lublin
Skarzyska-Kamienna
LEGEND:
Completed single-track lines
" dooble " "
Junctions